

K & E

DRAWING INSTRUMENTS



KEUFFEL & ESSER CO.
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KEUFFEL & ESSER CO., NEW YORK

K & E DRAWING INSTRUMENTS

PARAGON
ANCHOR
MINUSA
ARROW
KEY

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KEUFFEL & ESSER CO.

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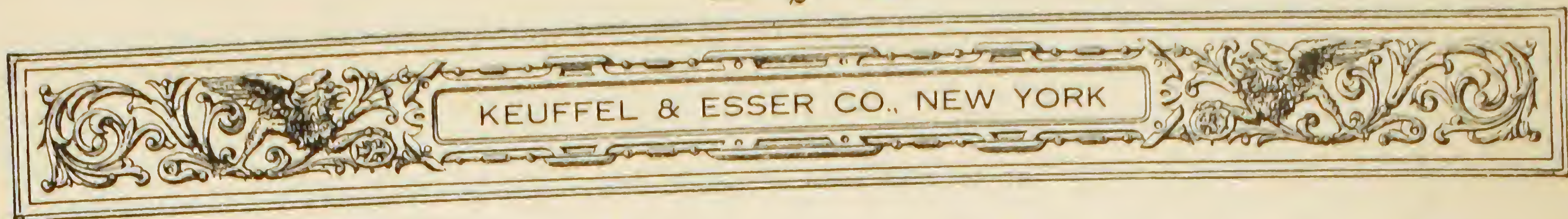
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Drawing Materials, Mathematical and Surveying Instruments, Measuring Tapes



K & E DRAWING INSTRUMENTS

The quality of drawing instruments, which frequently becomes evident only after they have been put to actual use, cannot be determined from mere inspection of the goods, except by experts; so that the purchaser is seldom able to tell just what quality of instruments is presented for his approval. This is especially true when the general appearance of a good instrument has been closely imitated by an inferior one. Hence, the assertions of those who supply the instruments must be relied upon.

Our intimate practical and theoretical knowledge of drawing instruments, extending over a period of nearly sixty years, and based not only upon a close study of the requirements of the American draftsman, but upon hard-earned experience in the manufacture of drawing instruments in **our factory in the United States**, furnishes a sufficient guarantee that our statements as to the respective qualities of the instruments hereafter described can be absolutely relied upon.

The various lines described in this catalogue cover every demand for instruments suitable to professional use, from the very best to those of the lowest price at which serviceable instruments can be offered. Hence, since we meet every demand, we have no object in misrepresenting any particular style or grade of instruments. All are described accurately, in order that it may be apparent to the prospective purchaser which grade of instrument is best adapted to his particular requirements.

It cannot be too strongly emphasized, however, that for the professional and prospective professional draftsman, it is advisable and, in the end, more economical, to buy the best instruments that he can afford. **Good instruments will meet all requirements**, and the saving in time and the satisfaction resulting from their use, the better work which can be done with them, and their permanence, amply justify the paying of higher prices. Instruments which prove unfit for the purpose for which they were intended, are worthless to the purchaser, who will be obliged to replace them with better ones. **The most expensive instruments in first cost are the cheapest in ultimate cost.**

MATERIALS

The metals most commonly employed in drawing instruments are nickel silver and steel. While it is evident that steel must be of good quality and properly tempered, the requisite properties of nickel silver are less commonly recognized.

Formerly, the cheaper grades of drawing instruments were constructed of cast nickel-silver, but to-day the general use of machine tools has made the use of rolled (sheet or plate) nickel-silver the rule for all grades. The process of rolling, however, does not insure a high quality of nickel-silver, since quality depends not only upon the proportions of the metals in the alloy, but also upon the density and hardness resulting from the cold-rolling of the metal. The amount of compression produced by the rolling has a great influence upon quality—the metal for the higher grades being worked over considerably more than that for the cheaper grades. Hence, with the better quality instruments, greater strength and rigidity is obtained with the same volume of metal.

All of the instruments described in this catalogue are made of the highest grade of steel and cold rolled nickel-silver.

DIMENSIONS

The length of the instruments, as given in this catalogue, is "over all," including the handle. Such lengths are subject to slight variations.



PARAGON DRAWING INSTRUMENTS

Paragon Drawing Instruments, because of their super quality, stand in a class by themselves. They are hand fitted and finished by artisans who attain the requisite technical proficiency only after a long apprenticeship and years of special training. Instruments of the fit and finish of these cannot be produced by machinery alone.

Paragon instruments are specimens of the craftsman's art at the best, produced by artisans who have the real "craftsman's pride in his work". Hence, every instrument, while resembling hundreds of others in general appearance, has its own individuality.

Paragon instruments are superb in their material, fitting, balance, precision and beauty of line and finish. **They are a delight to both the hand and the eye.** They permit the draftsman to transfer to cloth or paper the very best work of which he is capable at the least expenditure of time and trouble. As their name indicates, they are models of excellence.

No one who has ever used **Paragon** instruments will be satisfied with any others.

Attention is directed to the following special features of **Paragon** instruments.

FINISH

The finish of **Paragon** instruments may be termed "mathematical instrument finish." Since it is designed to bring out perfection of workmanship and form, and to insure their permanence, it would, incidentally, bring out any flaw or fault, did any exist.

Mathematical instrument finish should not be confused with that resulting from buffing, sometimes used on instruments of so-called high quality. Buffing, in producing a glossy surface, partly effaces angles and edges, and frequently serves to obscure flaws and imperfections resulting from a cheapened cost of production.

CONSTRUCTION

DRAWING OR RULING PENS. Since the drawing pen is that instrument of a draftsman's outfit which is in constant use, defects in quality or construction soon make themselves felt.

Material. A good drawing pen should be made of special steel of the right temper—neither too soft, nor hardened to excessive brittleness. These desirable qualities have been secured for **Paragon** pens through the use of a special steel made in accordance with very rigid specifications; and which can be tempered to give exactly the right hardness to the points without making them unduly brittle.

General Design. The nibs, or points of the blades, should be accurately set; both of the same length; both smoothly rounded, and both equally firm when in contact with the drawing.

The point, as a whole, should be shaped fine enough to permit absolute control of the contact of the pen in starting and ending lines, without being so fine as to tend to cut the drawing surface. Otherwise, it should be as broad and rounded as possible, in order to hold a considerable quantity of ink without the danger of its spilling out.

The lower (under) blade should be rigid enough to resist any tendency to close it up against the upper blade when the pen is being run along the straight-edge.

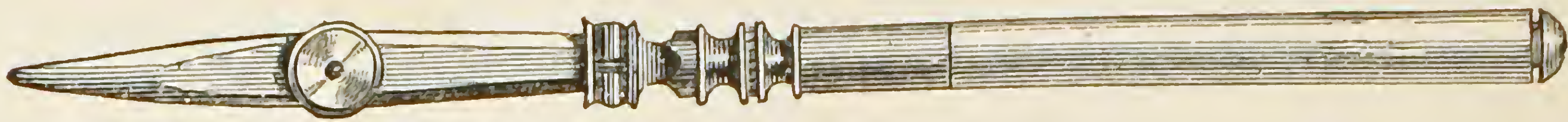
The spring of the pen, which keeps the blades apart, should be sufficient to maintain the upper blade at the distance from the lower one fixed by its user, but not so strong as to interfere with the easy adjustment of the thumb-screw.

The threads of the thumbscrew should be deeply and accurately cut so as to insure even motion and accurate setting, and to avoid the danger of stripping.



Joints. Drawing pens are generally of one of two types:

- (a) With a joint; which allows the blades to be thrown apart for cleaning.
- (b) Without a joint.

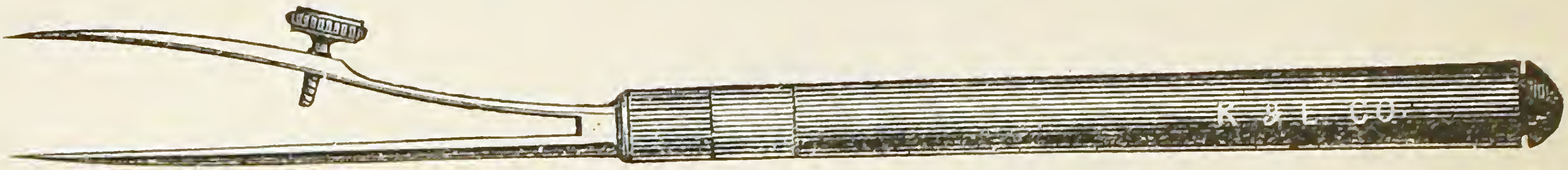


Pen with joint. (No. 527).



Pen without joint. (No. 521).

Pens without a joint, but in which the upper blade is made to spring open (spring blade), possess many of the advantages of a pen with a good joint, and avoid its disadvantages.



Pen with spring blade. (No. 523 $\frac{1}{2}$).

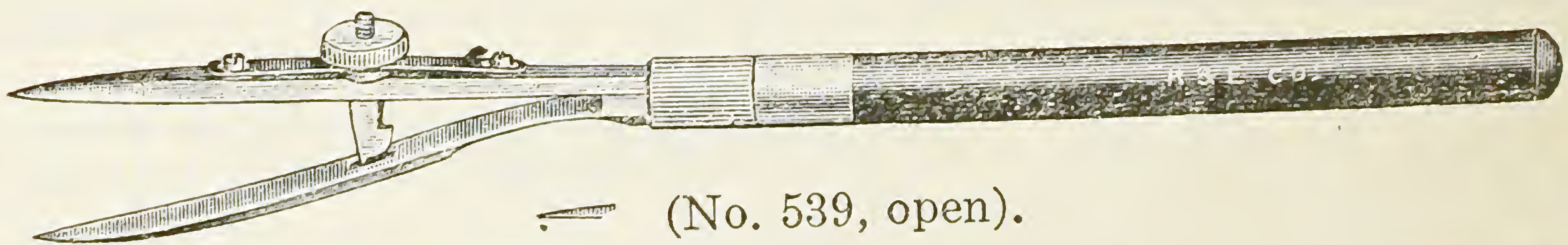
The **Detail Drawing Pen**, shown below, has a spring blade like that illustrated above. The blades in this particular type of pen are made wide in order that a sufficient quantity of ink may be held to admit of drawing long and heavy lines without the necessity of the frequent re-fillings which the ordinary drawing pen would require under the same circumstances, (Nos. 558-1-2-3).



Detail Drawing Pen (No. 558-2.)

Another jointless type of pen is exemplified in our

Paragon CLICK Drawing Pens (Patented)



(No. 539, open).



(No. 539, closed).

The upper blade of the Click Pen springs open when the hook is pushed off its bearing; and is restored to its prior setting through re-engaging the hook by pressing the blades together. The hook referred to is threaded through a spring on the lower blade, where it is engaged with the thumb-nut which regulates the setting of the blades for width of line. The hook itself passes through a slot in the upper blade, where it is held in position by the spring on the lower blade. This spring causes the hook to engage automatically when the blades are pressed together (Nos. 537 to 539, page 30). Opening the blades does not change the setting of these pens.



Drawing Pen with push screw. (No. 690.)

Pens for close ruling (hatching pens), since they must be very firm, are made without joints. In these pens the spring of the blades holds their points together. The latter are forced apart in one of two ways.

- (a) A thumb-screw threaded through the upper blade pushes directly against the lower blade.
- (b) A wedge between the blades separates or releases them, according to whether it is moved from or toward the handle by a threaded rod actuated by a thumbnut set at the upper end of the handle.

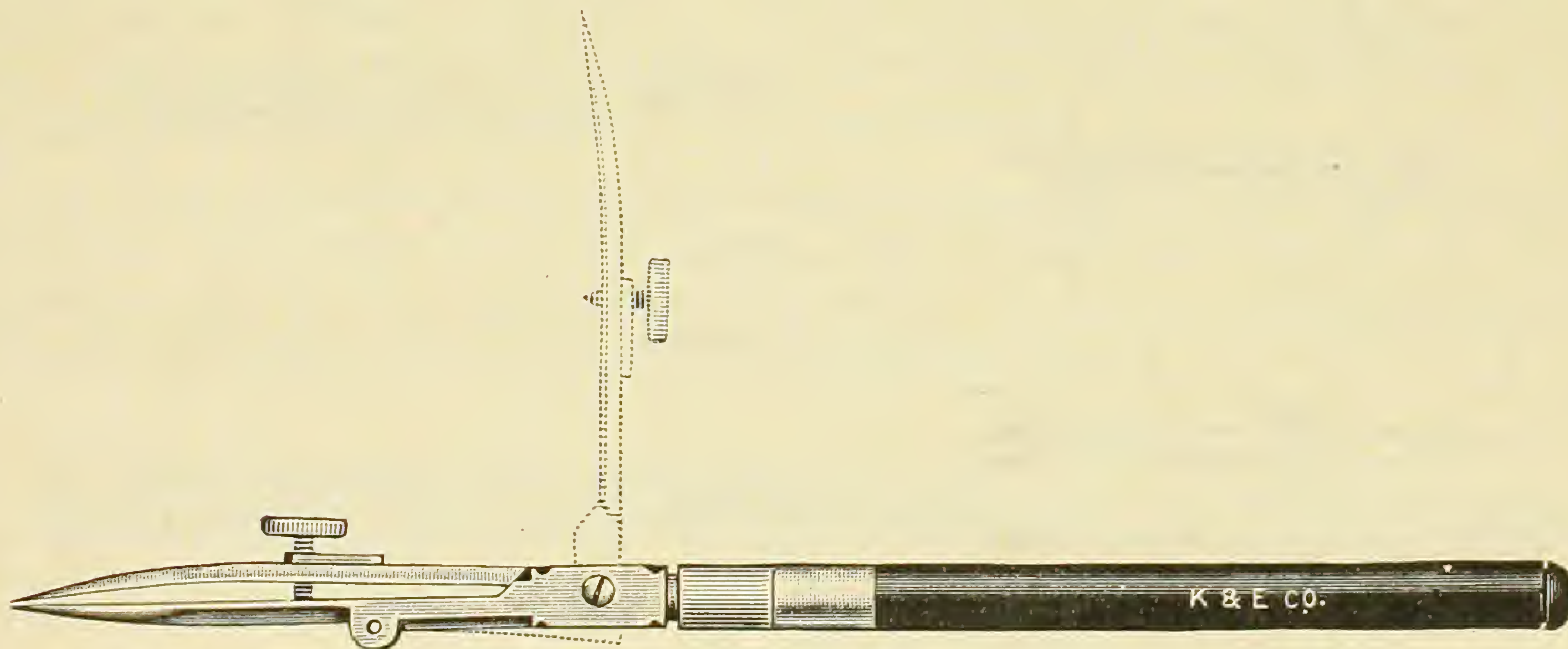
The wedge type is preferred by some, since the absence of the thumbscrew on the blade gives a better sight of the point of the pen. This is sometimes an advantage in crowded drawings.



Drawing Pen without thumbscrew. (No. 695).

In pens with joints it is necessary that the joint should be very carefully made; otherwise the upper blade becomes shaky and the pen, as a result, useless. A variation of the joint type of pen is illustrated below in our

KNIFE SPRING PARAGON PENS.



(No. 524 K).

Knife Spring **Paragon** Drawing Pen.

The Knife Spring **Paragon** Pens have a hinged upper blade actuated by a spring similar to that of a pocket knife, which either holds the pen open at 90 degrees or presses it firmly against the fixed blade. This construction requires the best of design and workmanship, as well as the highest quality of material.

Opening the pen for cleaning does not change the adjustment for width of line. (Nos. 522K to 524K, page 28).

TC 97-B248



The pen for drawing single curved lines has a hollow handle in which a thin rod rotates.



(No. 696).

Improved Curve Pen.

Since the blades are fastened to the end of this rod and are eccentric to it, they turn easily and follow the sharpest curve with precision. A pen of this kind enables the draftsman to trace curves with the least fatigue, since the hand may always be kept in a natural position. When required, this instrument may be quickly converted to the uses of a common ruling pen by tightening the small nut at the upper end of the rod. This clamps the handle.

A variation of the above pen is shown in the following illustration. In

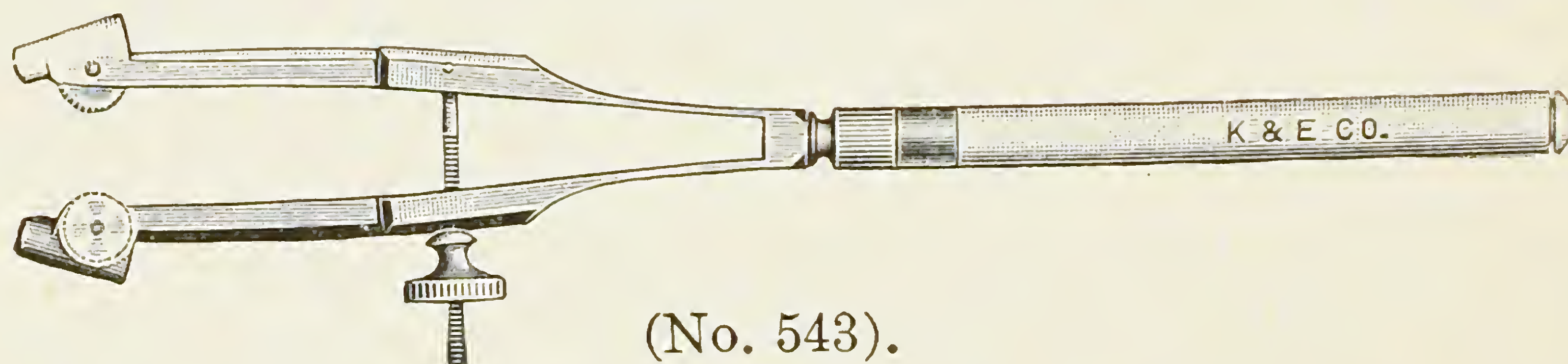


(No. 697).

Improved Railroad Curve Pen.

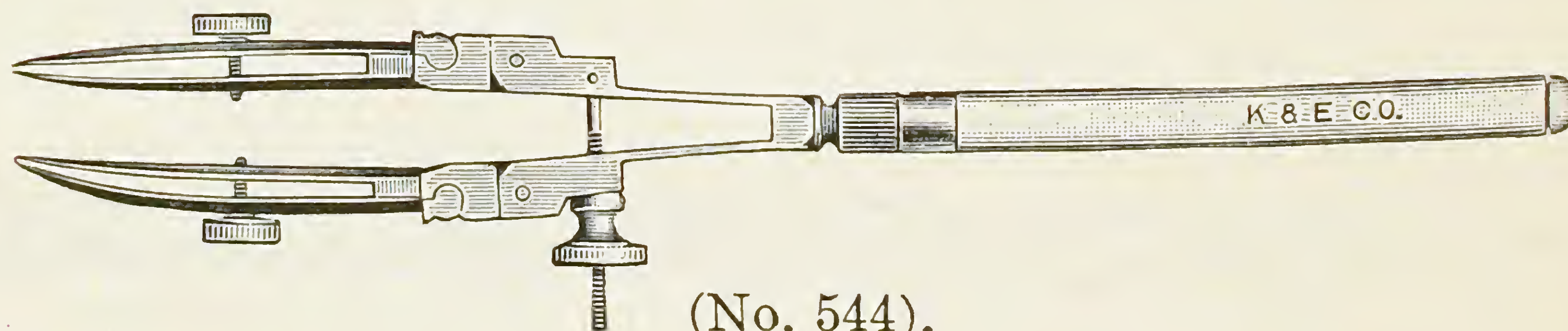
this two blades, attached to the rod, may be set at various distances apart. This arrangement makes the pen eminently suitable for drawing, at one operation, lines representing the two rails of a railroad track, the boundaries of a road or similar delineations.

Where it is desired to draw two parallel straight or moderately curved lines, at a minimum of time and labor, the railroad pen and pencil shown below are of great service.



(No. 543).

Railroad Pencil.



(No. 544).

Railroad Pen.

These instruments have long handles like the common ruling pen, whereas the two legs are joined by a spring-bow arrangement, which admits of the accurate adjustment of the two to any predetermined distance apart. Both pens have knee-joints, by means of which both may always be set perpendicular to the drawing. Likewise, both pens are turned in the same direction, so that lines can be drawn against a straightedge as readily as with a common ruling pen.

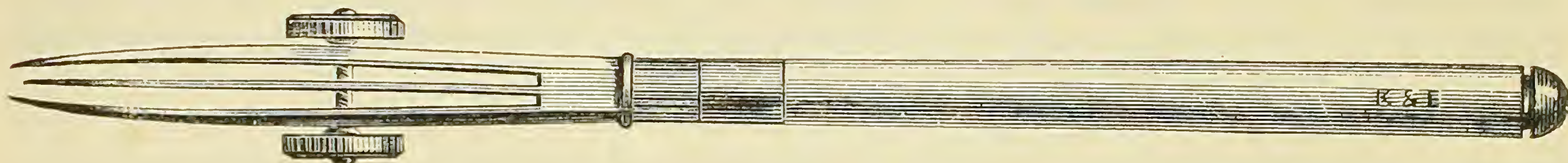


The railroad pen above described may also be employed for the purpose of ruling parallel border lines of moderate thickness. A special pen has, however, been designed for this purpose. This is illustrated below.



(No. 536).
Border Pen.

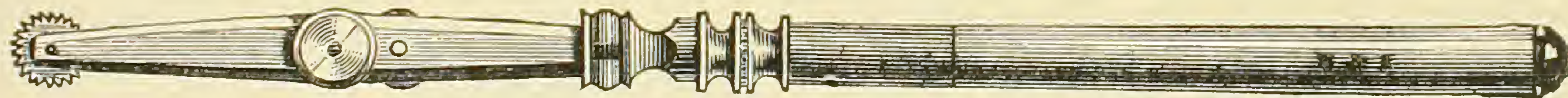
The border pen is intended to rule heavy parallel lines as in forming the border of a drawing. Hence, its blades have a greater capacity for holding ink than those of the railroad pen. It is also somewhat differently constructed from the railroad pen, since in the latter the upper blades are provided with springs, whereas in the border pen it is the lower blades which spring. Hence, the set screws are threaded in the upper blade only, their free ends pressing against the lower blades. The blades are turned in opposite directions. This pen may be employed for the same purposes as a railroad pen.



(No. 535).
Border Pen, for broad lines.

For ruling broad heavy lines up to $\frac{3}{8}$ of an inch thick, the pen illustrated above is often serviceable. A screw with right and left thread is fixed in the middle blade. Two large nuts upon this thread restrain the tendency of the outer blades to spring apart, and permit the quick and accurate adjustment of the nibs to the proper setting.

In order to facilitate the work of drawing dotted lines, a good dotting pen is desirable. It must be carefully designed and constructed so that the ink will be supplied to the dotting mechanism as required. Otherwise the drawing will be blurred. Such a pen is shown in the following illustration.

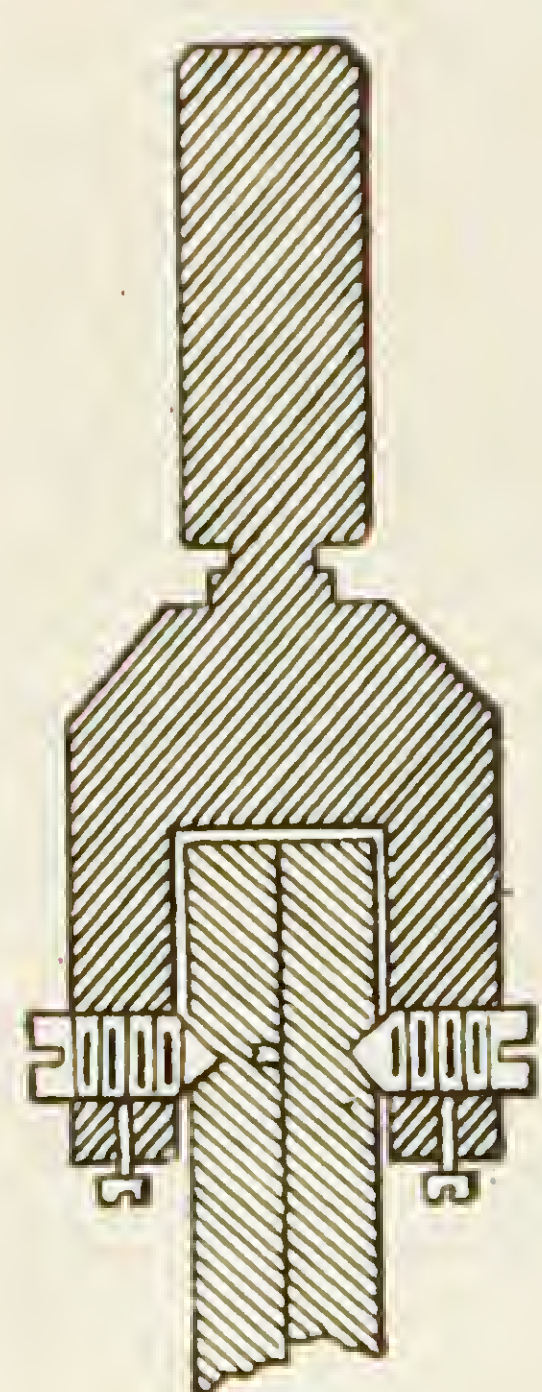


(No. 551).
Dotting Pen.

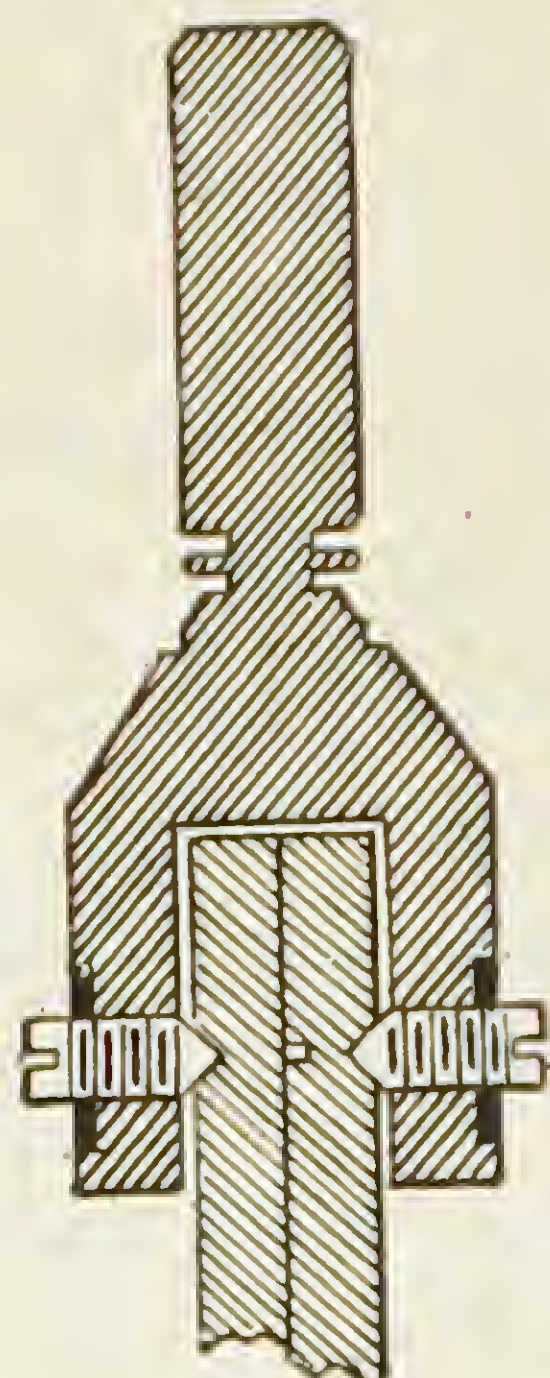
The inner surface of the under blade is surrounded with a thin metal edging, thus forming a reservoir for the ink. The blades can be brought together by the thumb-screw, thus closing the reservoir on all sides, except a narrow space at the bottom, through which the ink flows to the dotting wheel. No more than the requisite quantity of ink is supplied, which prevents blotting. This pen has six wheels, each producing a different pattern of broken line. When not in use these wheels are housed between the upper parts of the blades.



COMPASSES AND DIVIDERS. The Head. The head of the compasses and divider, which forms the joint between the legs, is its most essential part. The thing sought in designing the head is to obtain sufficient friction between the heads of the two legs so that the brace or fork which holds them together may be rotated without disturbing their setting. Since the brace or fork must also have sufficient friction to keep it in any position in which it may be set, the problem resolves itself into joining three parts, two of which must have considerably more friction between their surfaces than that between them and the third part. This problem has been solved by means of the pivot joint.



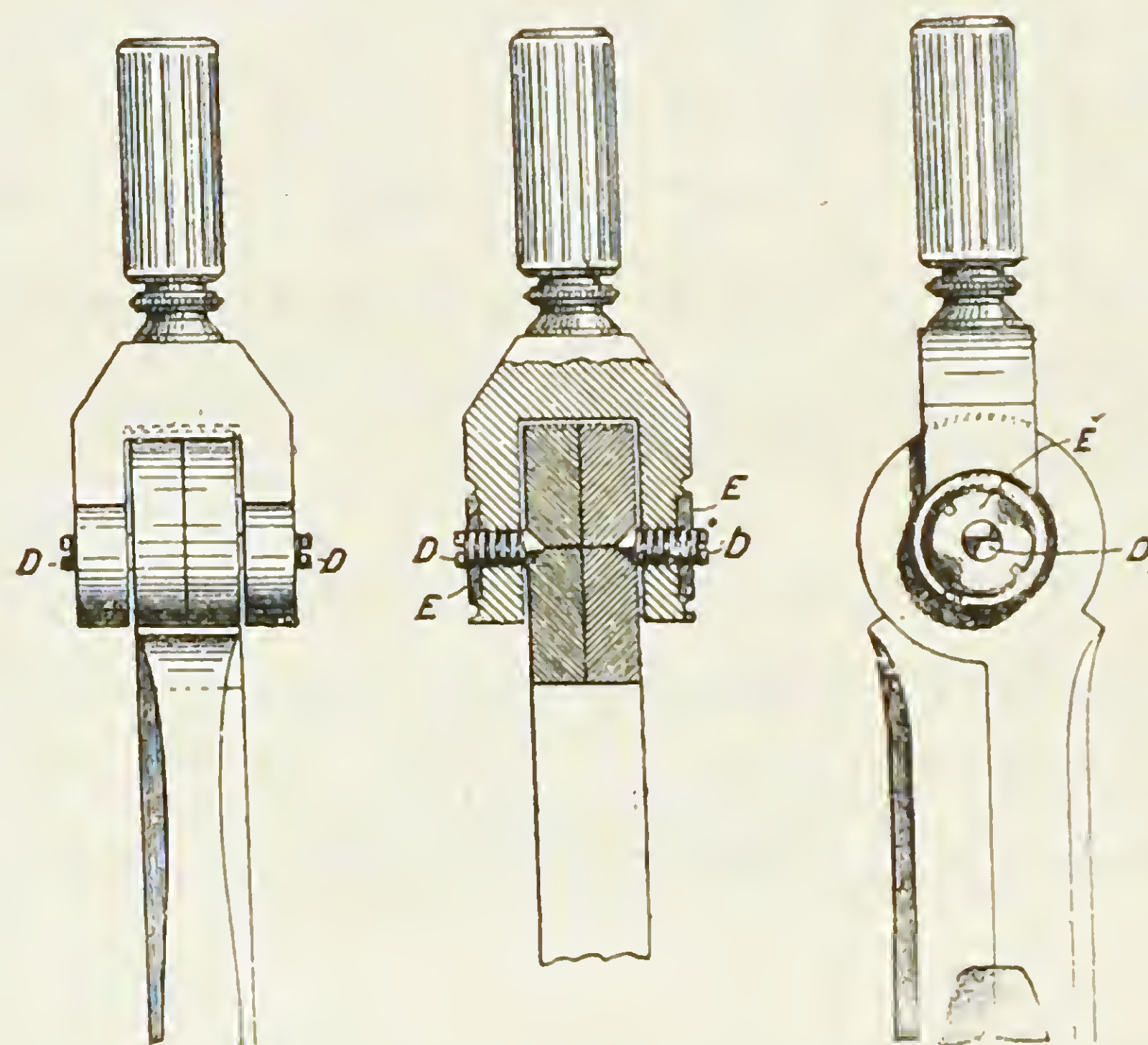
Ordinary
Pivot Joint



Esser's
Pivot Joint

The pivot joint is constructed as follows: The head of each leg is shaped like a disk. The two disks are held in contact in a brace or fork by means of two pivot screws, whose points are hardened steel cones, and which fit into conical depressions in the heads of the two compass legs. Hence, the friction between the two comparatively large surfaces of the disks is considerably greater than that of the two conical points of the pivots with the disks. However, the rotation between the brace or fork and the legs has a tendency to unscrew one or the other of the pivot screws, which makes it essential that some locking device be employed to keep the pivots from unscrewing.

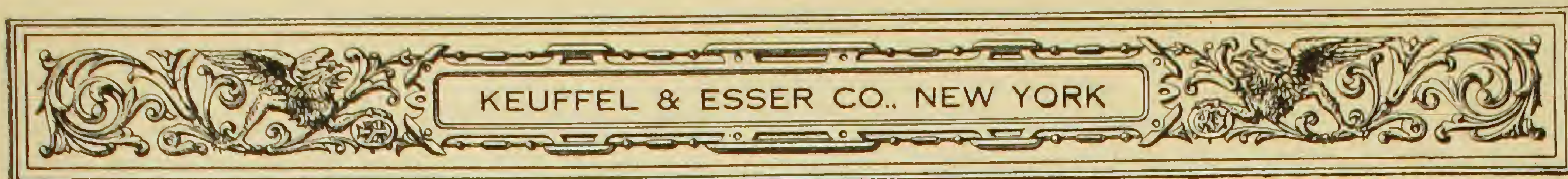
In the ordinary pivot joint the pivot screws are locked by means of two slender set screws passing through the free ends of the brace and bearing against the threads of the pivots. In **Paragon** instruments the locking is more efficiently done by the use of



ESSER'S PIVOT JOINT

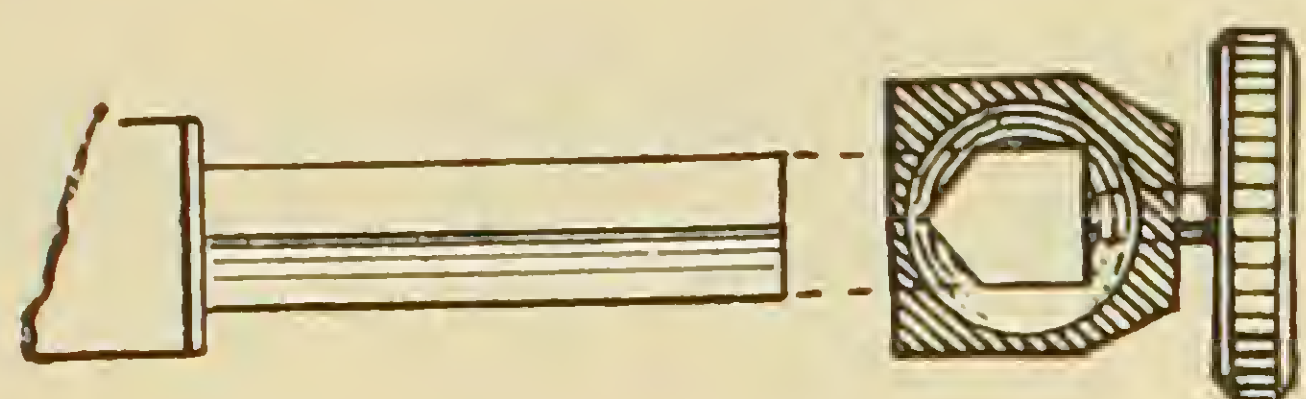
The essential features of Esser's Pivot Joint, which is applied only to **Paragon** instruments, are the following:

The pivots, DD, as shown in the figure, are held securely by means of steel lock nuts EE, which fit snugly in circular recesses in the arms of the brace (fork), and which are tapped to correspond to the screw threads of the pivots. By sinking the lock nuts in the recesses as shown, the joint presents a well proportioned and beautiful appearance, all risk of injuring the screw threads of the pivots or of breaking the set screws (through catching upon extraneous objects) is avoided, and no place is left for the collection of dust. Hence, the lock nuts are much *more efficient* than the small set screws, while the readjustment of the joint is not in any way rendered more complex. **To insure proper adjustment of our Paragon instruments, we will readjust them at any time without charge.**

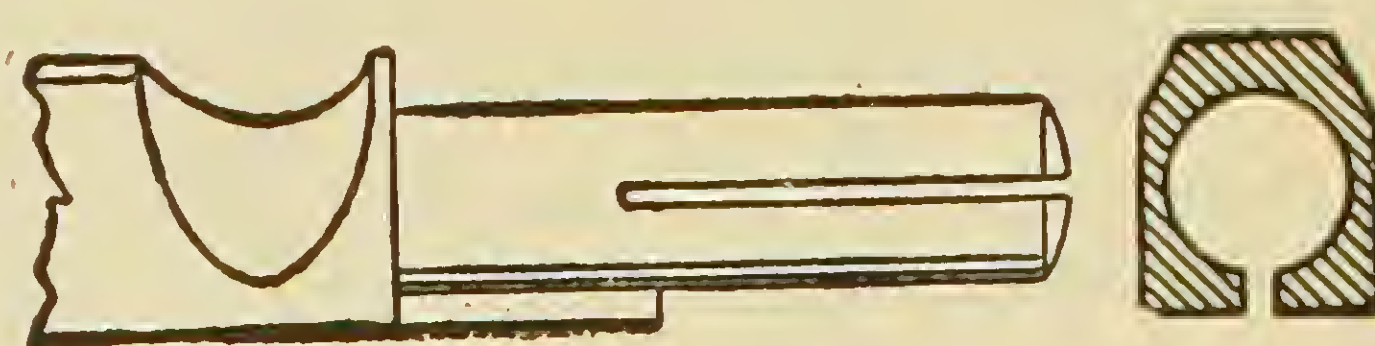


Especial attention is called to the fact that Esser's Pivot Joint has been very closely imitated, but only in outward appearance and therefore without its advantages.

Insertion Pieces. Another important feature in the compasses is the manner of inserting the several points (parts) belonging to them. Here, as is frequently the case, most makers recommend that which costs least and is easiest to make. In the following illustrations are shown the patterns for shanks of insertion pieces which are applied to **Paragon** instruments; the long and strong pentagonal shank, and the round shank with steel feather and spring socket.



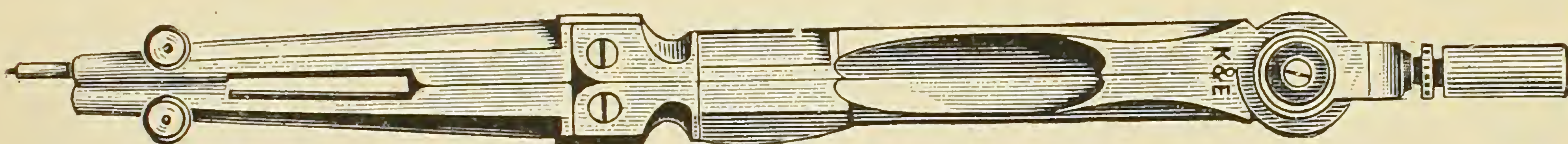
Pentagonal Shank with Set Screw.



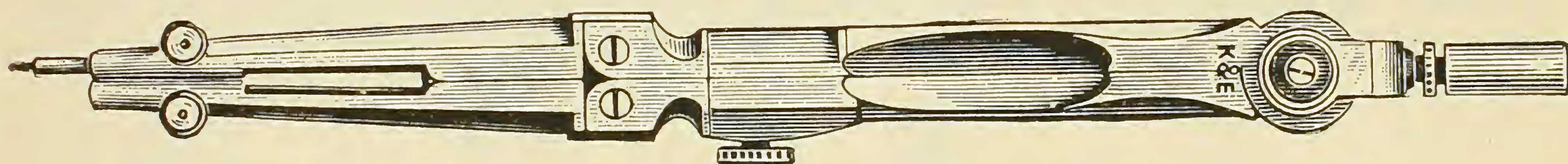
Round Shank with Steel Feather.

The pentagonal shank should engage in a socket of the same shape and size. It should be held in place by a screw which presses the wedge into the corresponding groove in the socket. This insures perfect alignment of the instrument even after many years of wear.

The round shank is held by the spring of the socket and is kept in alignment by a steel feather. This construction, if properly made, offers many advantages. It is inserted and removed more quickly than parts requiring a thumbscrew; there are no screws to wear out or to be lost; no screwheads to obstruct the sight; and the instrument can be made lighter and of a more graceful form.

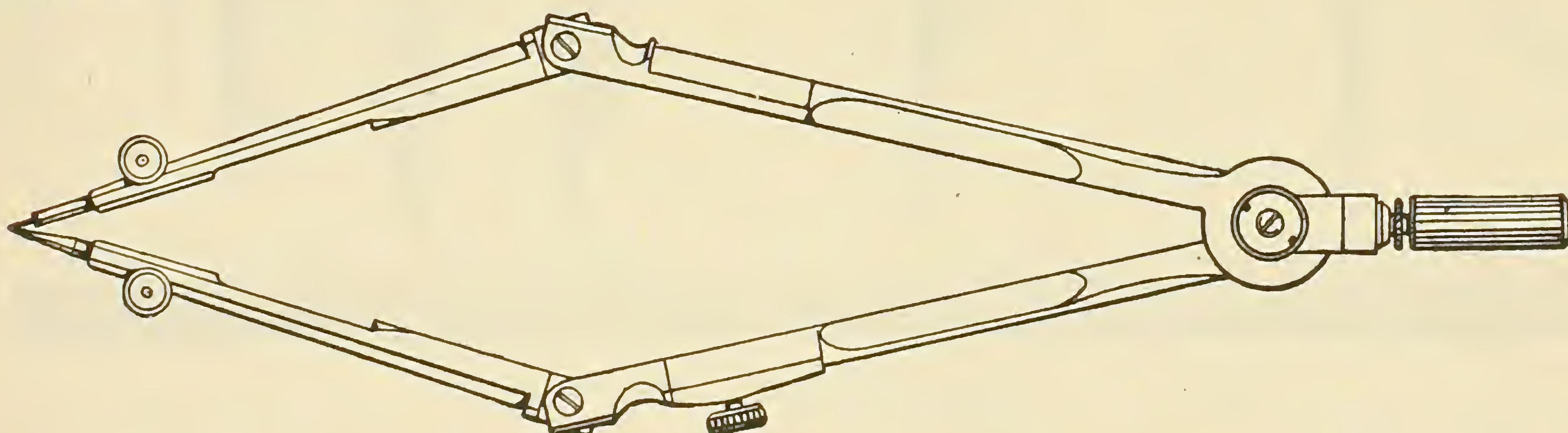


Compasses, with round shank pencil point inserted (no thumbscrew).



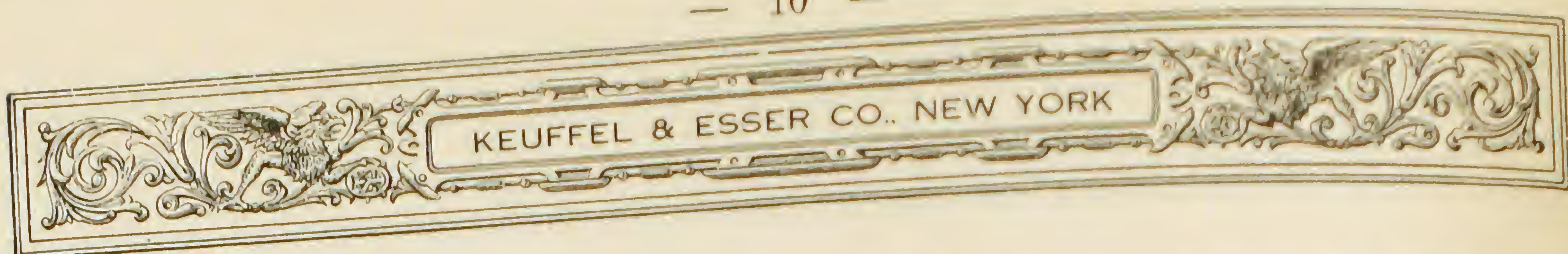
Compasses, with pencil point with pentagonal shank inserted.

However, the round shank for insertion pieces requires the most precise workmanship, as well as the very best of material, to render it permanently satisfactory. Since both of these conditions obtain in our **Paragon** Instruments, we have listed compasses with the round shank and steel feather under No. 610 R (page 16.)



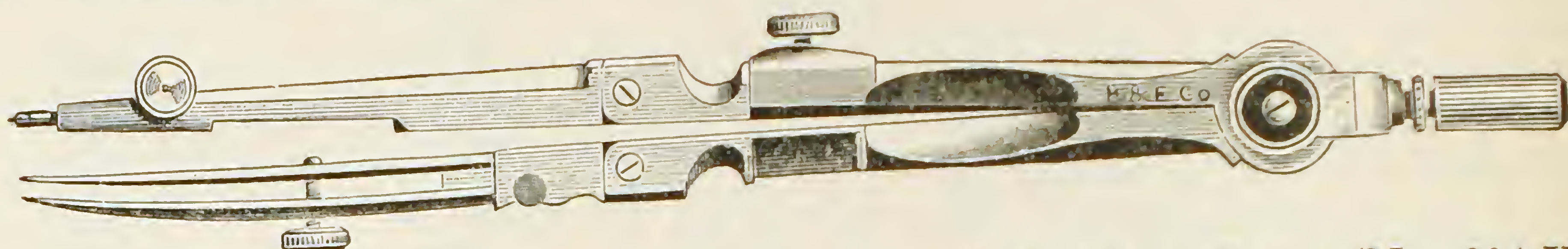
Compasses in position for testing alignment.

Joints. All joints in compasses and their parts should move in the same plane. This is readily tested by inserting the several parts and then folding the



compasses as shown in the above cut. If the joints are perfect, and the shanks properly aligned in the sockets, the extreme points of the instrument will meet. Every good instrument should meet the requirements of this test.

The knee joints of our **Paragon** instruments are provided with accurately fitted steel plates, which insure the greatest smoothness and ease in operation with the minimum of friction and wear. Hence, these joints so seldom get out of order that the occurrence, even after many years of use, is generally due to an exceptional accident. Should such an accident occur the instrument should be sent to us for readjustment.

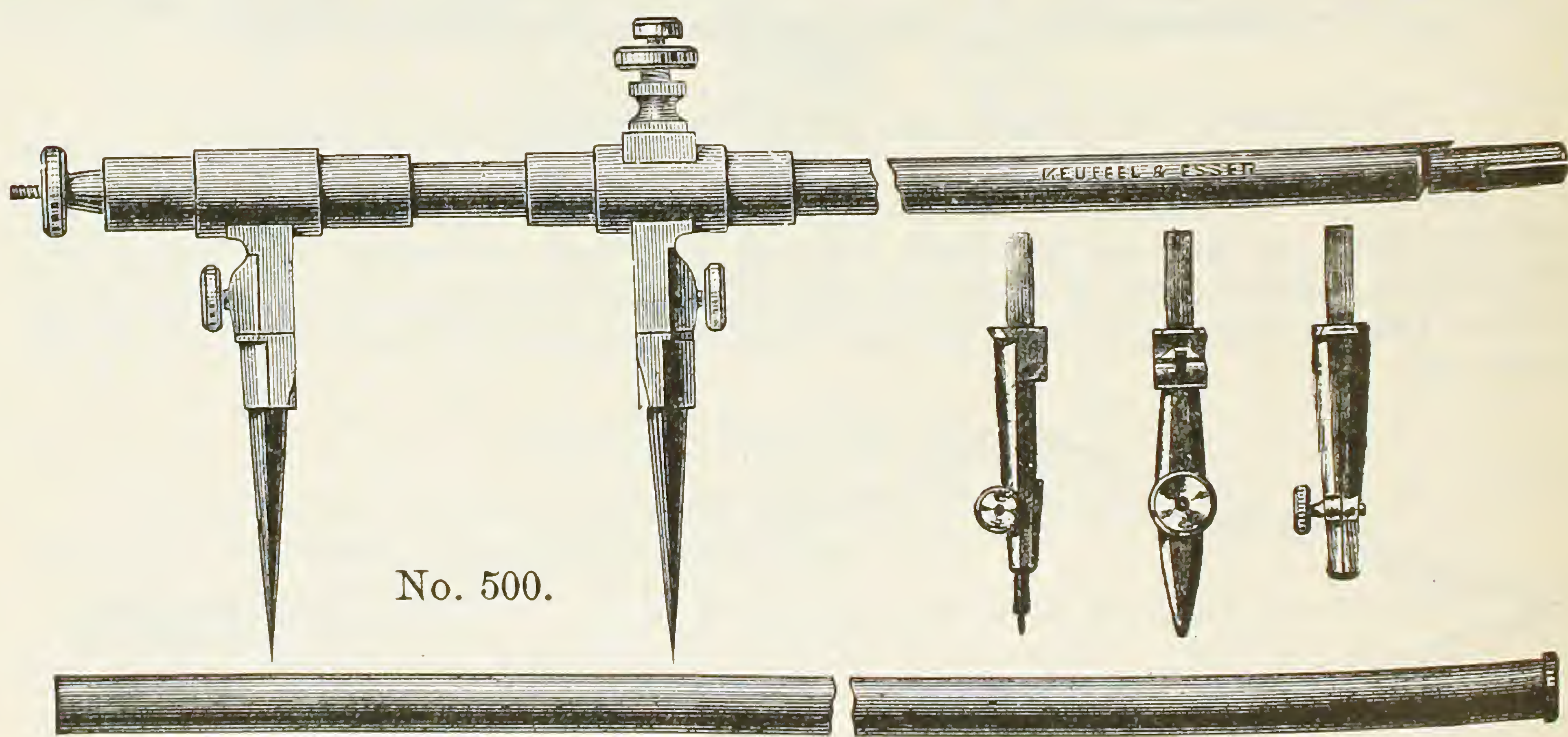


Compasses with hairspring, showing fixed needle point and pen (No. 604 H)

Hairsprings. Some draftsmen prefer to make minute adjustments of the compasses and dividers by means of the hairspring. The addition of a hairspring to any instrument of this type necessitates the highest quality in design and workmanship in order to render it precise, effective and durable. We can guarantee that the hairspring construction in our **Paragon** instruments is unsurpassed in precision, effectiveness and durability.

Beam Compasses. When it is required to measure or transfer considerable distances on a plan or drawing, or to describe arcs having long radii, recourse must be had to Beam Compasses. Hence, these serve as both compasses and dividers.

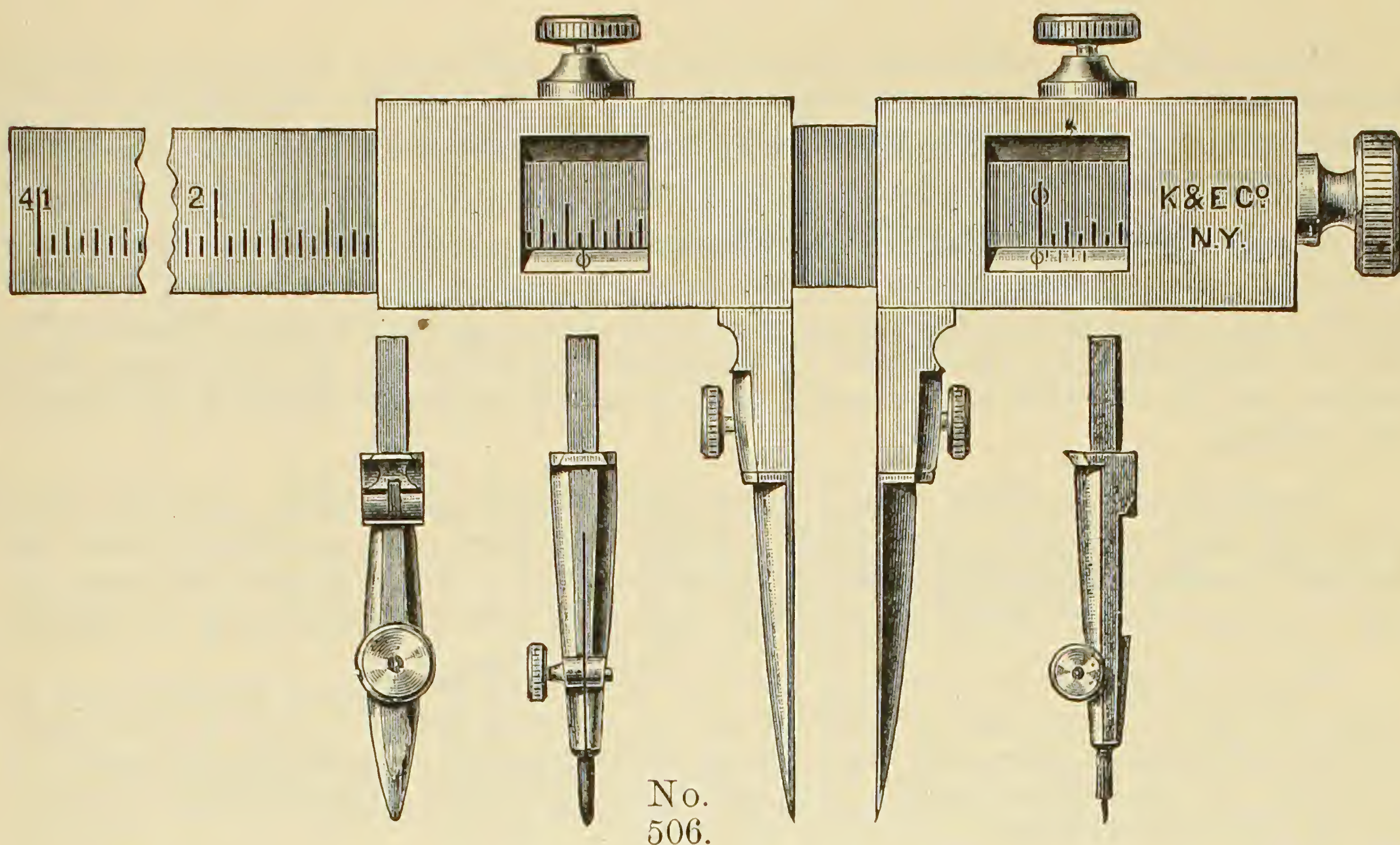
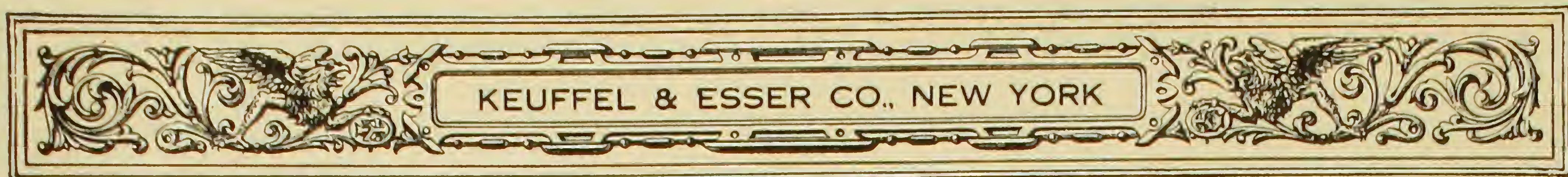
The Beam Compasses consist, in the main, of three distinct parts: (1) a box or sleeve of nickel silver, provided with means for clamping it to a bar or tube, which carries the pen or pencil and a micrometer for making the ultimate fine adjustment of the drawing point to the desired length or radius. (2) a box or sleeve of nickel-silver, provided with a clamp, which carries the fixed or center point, and slides freely along a bar or tube; and (3) a tube of nickel-silver, or a bar of the same or of wood, to which the boxes or sleeves are attached.



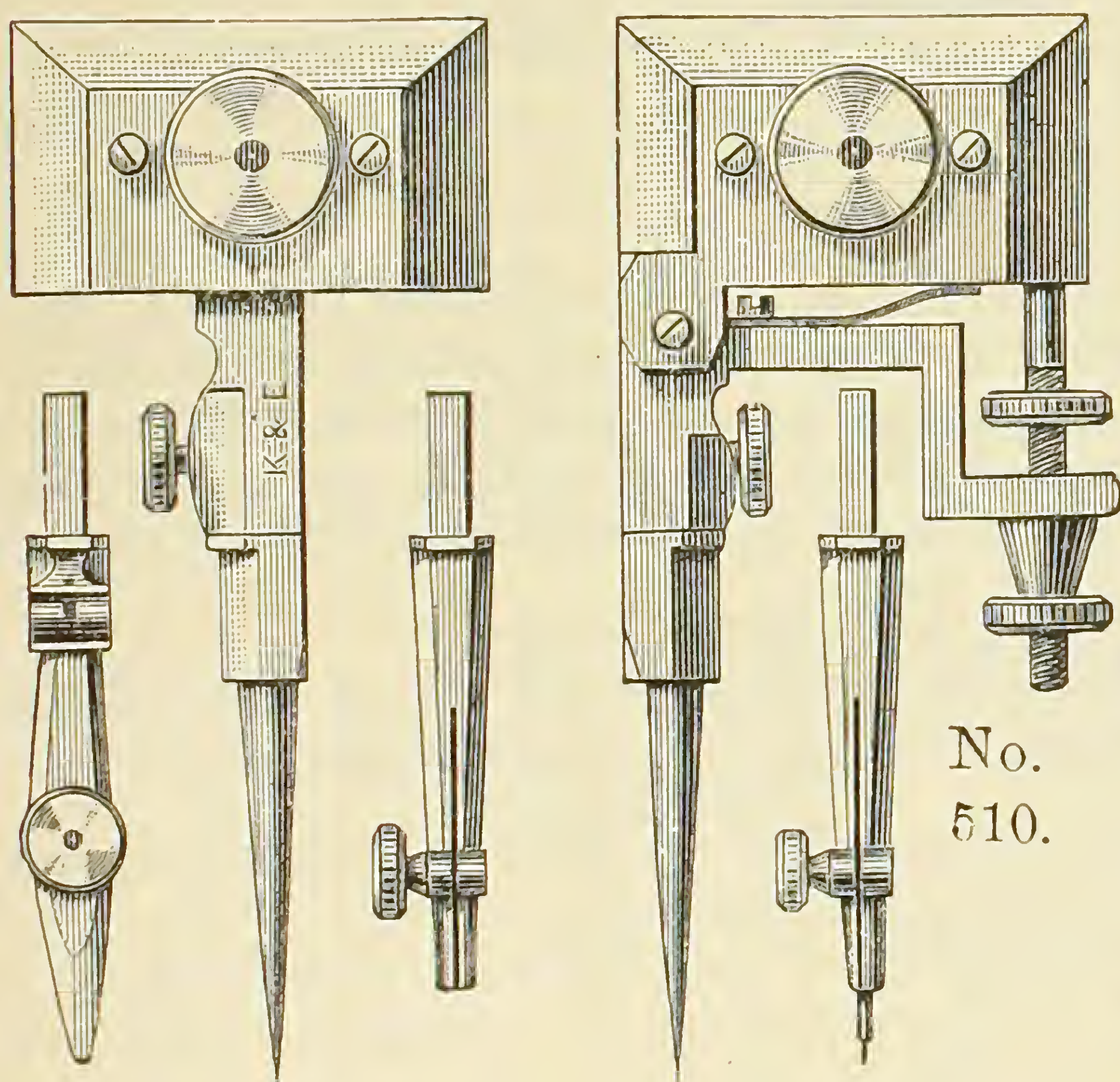
No. 500.

Tubular Beam Compasses.

The above illustration shows the tubular beam compasses, with the bar in two sections. The micrometer screw is shown at the left end of the upper bar. Similar beam compasses, with the bar in three sections, and a total reach of 38 inches, are regularly furnished.

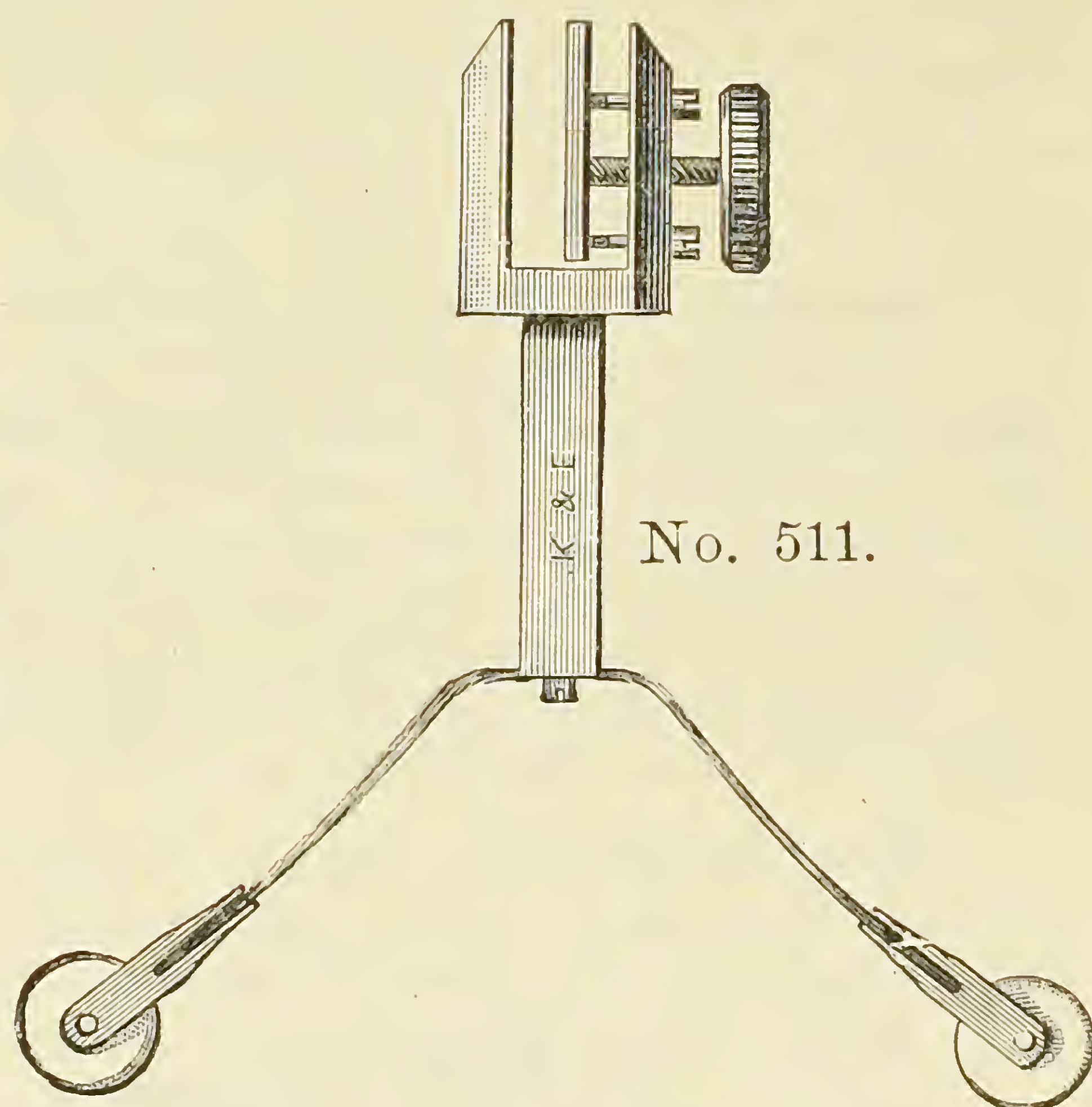


The preceding illustration shows beam compasses with a rectangular tubular bar of nickel silver, 44 inches long, which is graduated to read to $\frac{1}{200}$ of an inch and $\frac{1}{10}$ of a millimeter. This instrument, which is provided with a vernier, can be set directly by means of the graduated bar without the necessity of laying off the predetermined distance upon drawing paper.



No. 510.

Beam Compasses for use with straightedge or wooden bar.



No. 511.

Wheel attachment for beam compasses

The left-hand illustration above shows beam compasses, which may be used in connection with a straightedge or wooden bar. The micrometer adjustment on this is somewhat different from that on similar instruments, previously described, since the turning of the screw tilts the drawing point one way or the other to the desired setting.

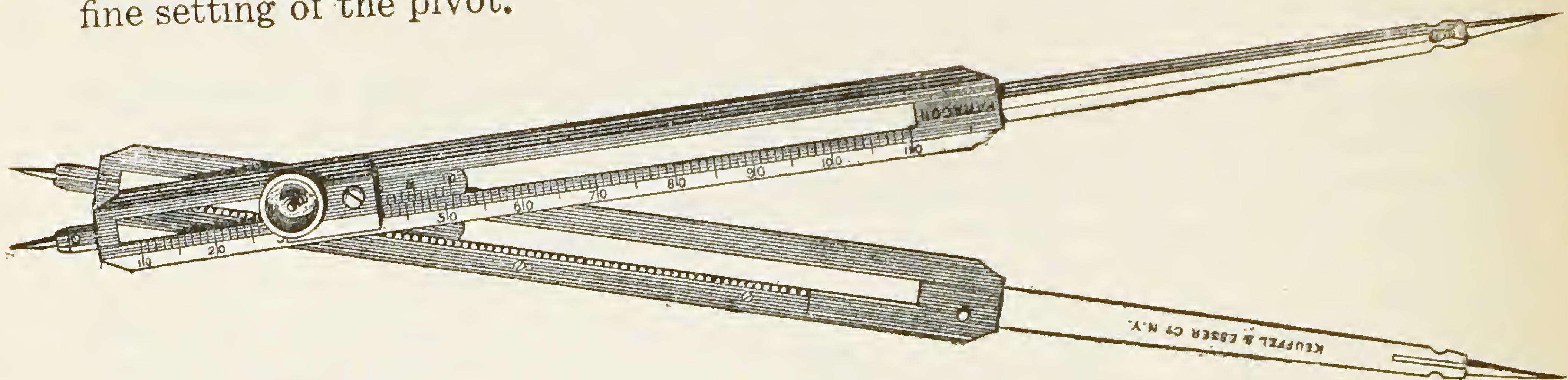


Work with the beam compasses may be considerably facilitated through the use of the wheel attachment shown above. This not only steadies the entire instrument, but insures the smooth and even travel of the drawing point over the drawing surface.

Proportional Dividers. These instruments provide a simple and accurate means of copying drawings to a reduced or to an enlarged scale. They not only enable the draftsman to reproduce the *lines* of a drawing to any desired ratio, but the drawing may also be so reproduced that the *areas* of any given plane surface, or the *contents* of any solid shall likewise be proportionate to those of the original.

Proportional Dividers consist of two legs, 6 to 9 inches long, with fine steel points at their opposite extremities. These legs turn on a movable pivot, the position of which may be so adjusted that the ratio of the distance between one pair of points to the distance between the other pair of points may be varied.

These adjustments are facilitated by means of a series of graduations or scales on the legs, any one of which may be made to coincide with a line traced across the slider attached to the pivot and running in a longitudinal groove in the legs. In No. 440 a vernier is attached to the slider, and this allows a very fine setting of the pivot.

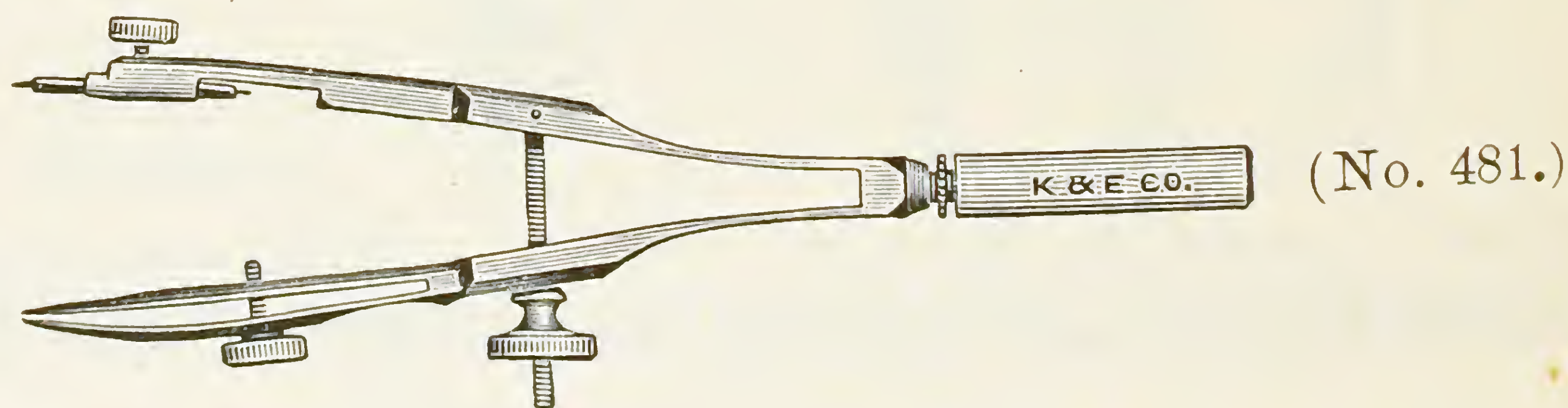


No. 440.

Paragon Proportional Dividers are of various types. Nos. 435 and 437 are divided for lines and circles; No. 439 for lines, circles, planes and solids; while No. 440, besides having a vernier adjustment, is so completely graduated that, in addition to the regular proportions given by No. 439, many special ratios, such as diameter of a circle to the side of an equal square, feet to meters, yards to meters, etc., may be rapidly laid off.

All of these instruments are provided with removable points, so that those parts which are most likely to wear or become broken are easily replaced.

SPRING BOWS. Bows, except for the handles, screws and nut, are made entirely of steel, in the symmetrical forms illustrated below.

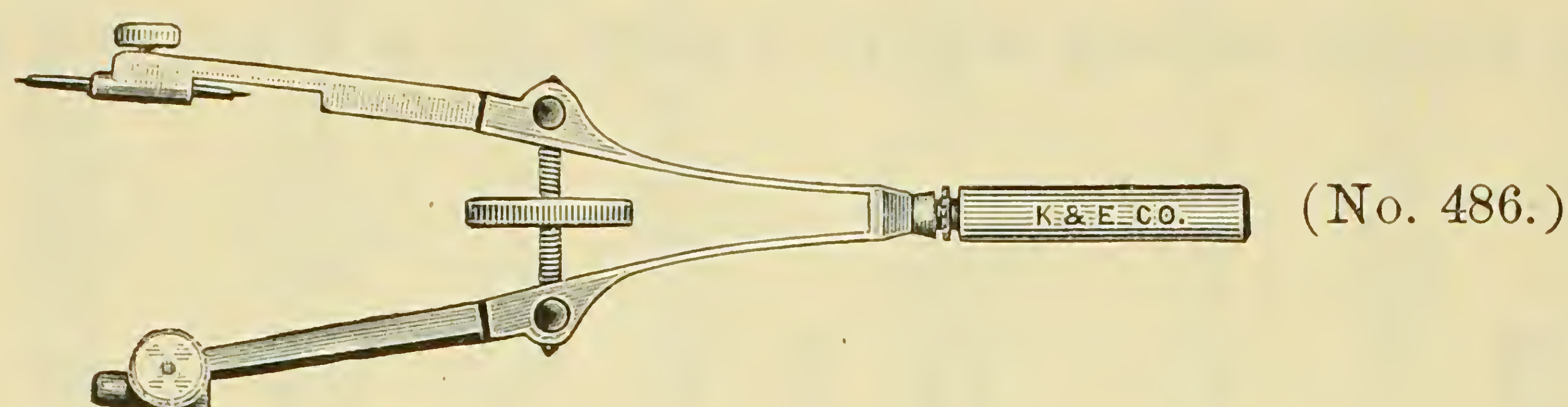


All that has been said of ruling pens relative to the necessity of a sufficiently stiff spring, and the pressure of the spring against the thumbscrew, applies equally well to bows of spring steel.



It should be borne in mind that the life of a bow may be prolonged indefinitely by compressing the spring with the fingers while setting the thumbnut. The latter should be used as the compressing agent only for the ultimate final adjustment of the points to the desired radius. This method insures minimum wear of the threads.

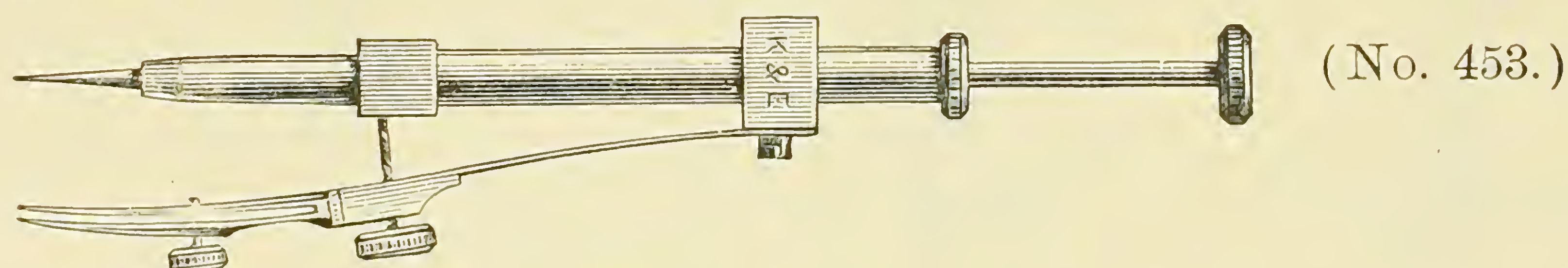
Where a bow instrument has considerable use, the center thumbnut proves to be a great convenience.



The illustration indicates the general arrangement of the center thumb nut, in which two threads, a right and a left, engaging in swiveling sockets, are moved by the one nut.

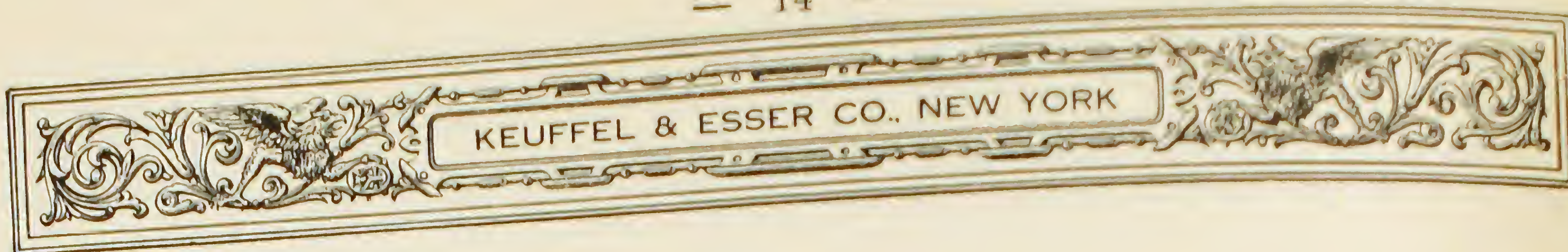
The chief difference between a single thread and a right and left thread bow lies in the fact that the stiffness of the spring bow, in which the two threads are employed, is not dependent upon the strength of the spring. Both legs of the bow are held rigidly by the screw; and the counter pressure of the spring is of minor importance. Moreover, since the two threads work simultaneously, both legs move at the same time, and the setting of the points is completed with only one-half the number of turns required with the single thread arrangement. The size and location of the center thumbnut add greatly to the convenience of operation, since, with practice, the draftsman learns to adjust it while in place upon the drawing by rotating the nut with the forefinger of the hand which holds the instrument. (Nos. 485 to 486 K, page 24).

Another useful pattern, especially adapted to drawing very small circles or arcs, is shown below:



In this instrument the center pin is held stationary, and the pen (or pencil) revolves about it. The former may be set upon the desired center point, and the pen (or pencil) then allowed to slip down to a bearing upon the drawing. When the arc or circle is completed the pen (or pencil) may be removed from contact with the drawing before the entire instrument is lifted clear.

This construction has the advantages that, since the center pin does not revolve, it will not wear an unsightly hole in the drawing; while the drop arrangement allows careful setting, insures uniform lines by means of its own natural pressure upon the drawing, and reduces to a minimum the danger of smearing. Hence, the instrument is the best spring bow for drawing circles or arcs of very small radii.



PARAGON INSTRUMENTS

REG. U. S. PAT. OFF.

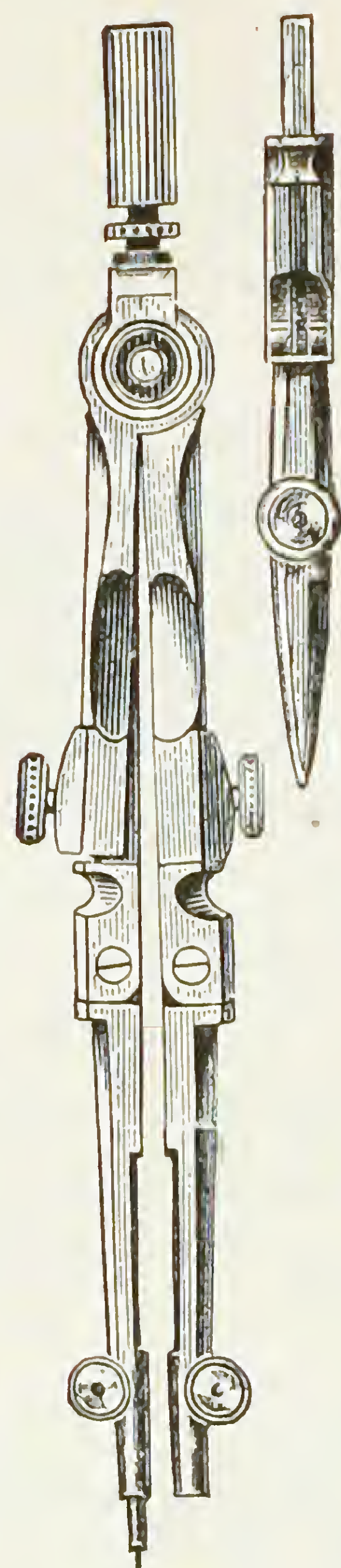
WITH ESSER'S PIVOT JOINT.

THE VERY BEST INSTRUMENTS MADE.

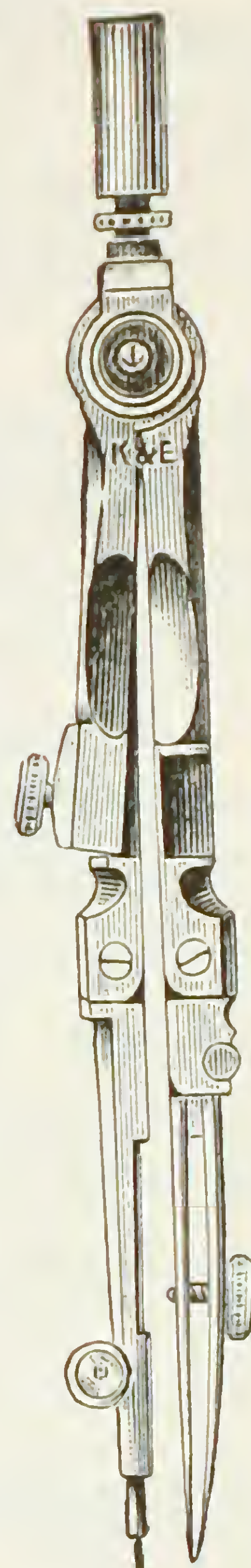
Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



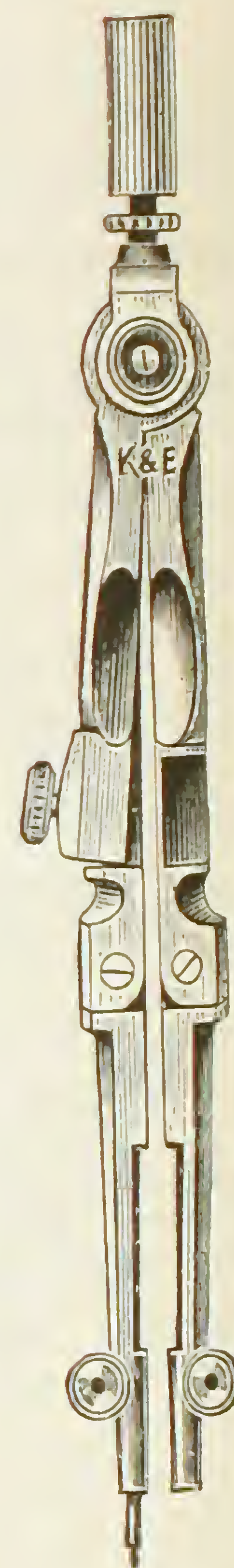
No. 601.



603 H.



604 H.



605 H.

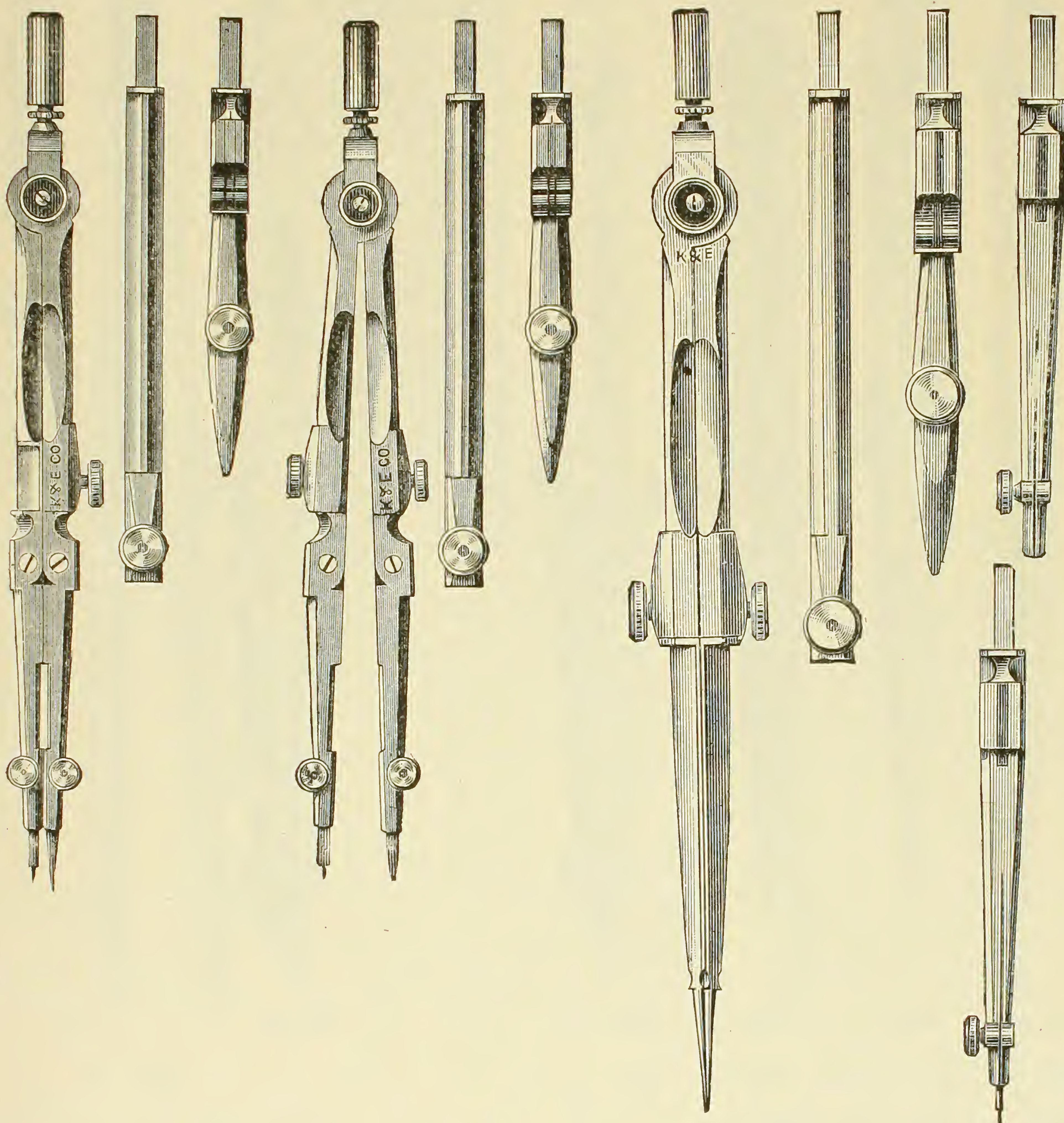
- | | | |
|--------|---|---------|
| 601. | Hairspring Divider, 4 in. | each \$ |
| 603 H. | Compasses, $4\frac{1}{4}$ in., with fixed Needle Point, Pen and Pencil Point, and with Hairspring . . . | " |
| 604 H. | Compasses, $4\frac{1}{4}$ in., with fixed Needle and Pen Point, and with Hairspring | " |
| 605 H. | Compasses, $4\frac{1}{4}$ in., with fixed Needle and Pencil Point, and with Hairspring | " |



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

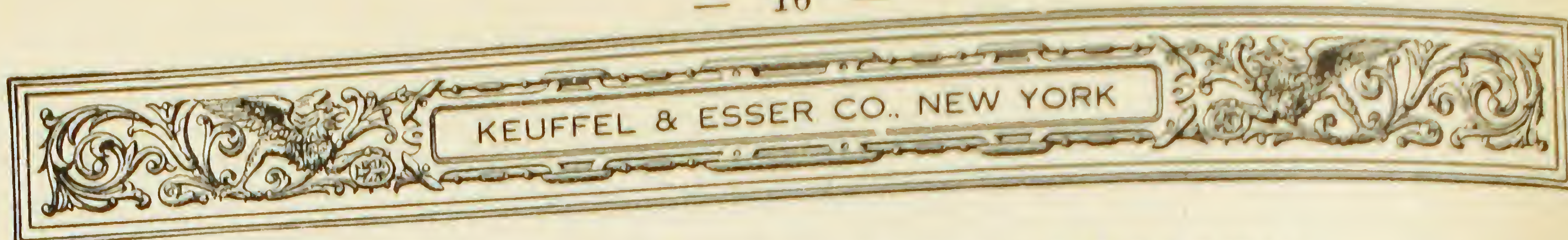


No. 611.

611 H.

612.

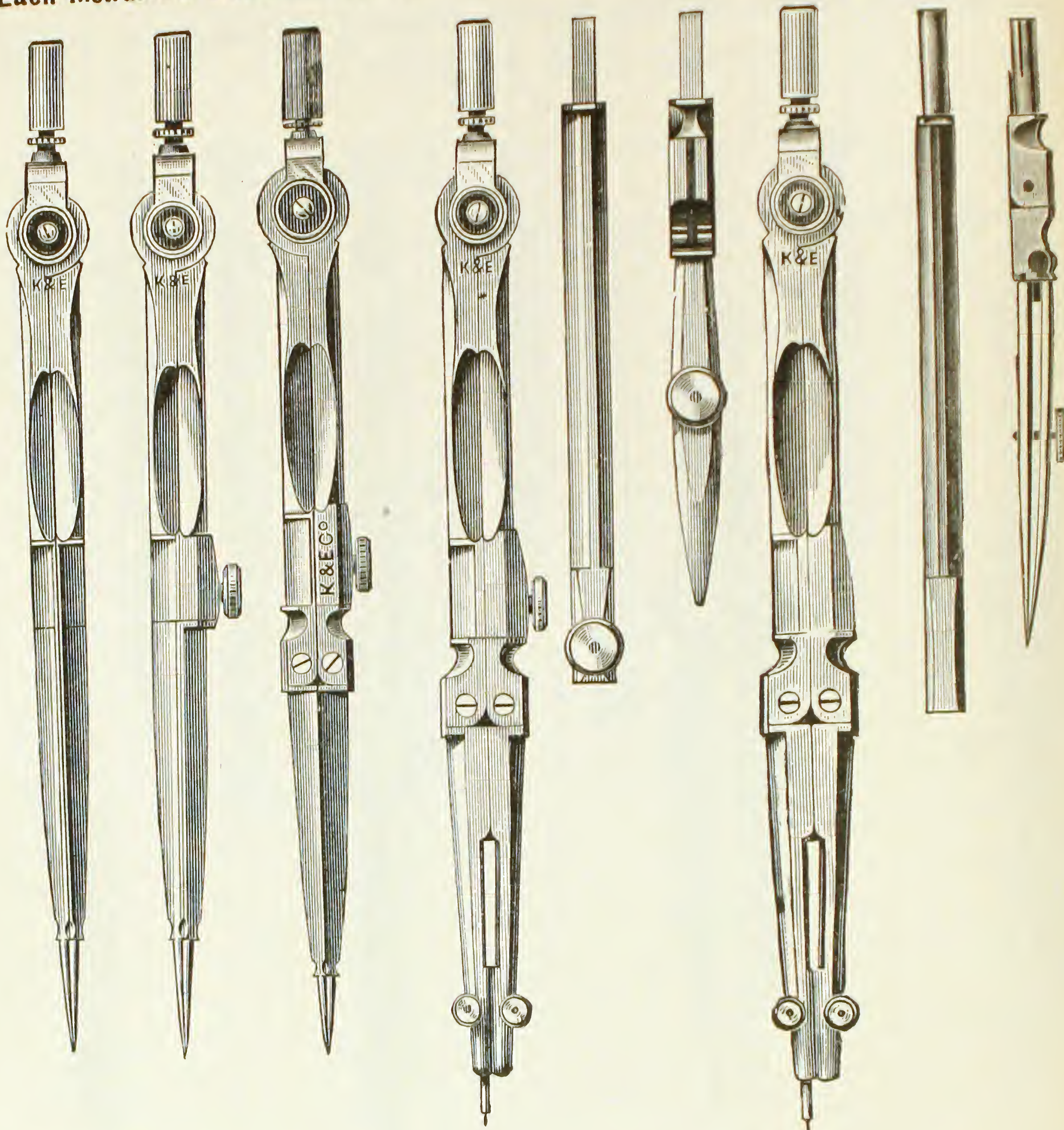
- | | | |
|--------|--|---------|
| 611. | Compasses, 5 in., with fixed Needle Point, Pen, Pencil | |
| | Point and Lengthening Bar . . . | each \$ |
| 611 H. | do. 5 " like No. 611, but with Hairspring . . | " |
| 612. | do. 6 $\frac{1}{4}$ " with 2 Steel Points, Pen, Pencil, Needle | |
| | Point and Lengthening Bar . . | " |



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No.	606.	608.	608½.	610.	610 R.	
606.	Plain Divider,	5¾ in.				each \$
607.	do.	6¾ "				"
608.	Hairspring Divider,	5¾ in.				"
608½.	do.	do.	5¾ "	with Joint in each leg		"
609.	do.	do.	6¾ "			"
610.	Compasses,	6¼ in.,	with fixed Needle Point, Pen, Pencil Point and Lengthening Bar			"
610 R.	do.	6¼ in.,	like No. 610, but the insertion pieces with round shank (no thumbscrew)			"

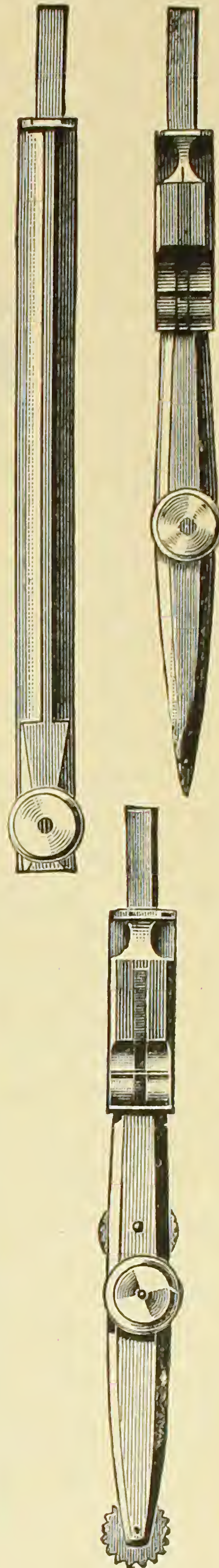
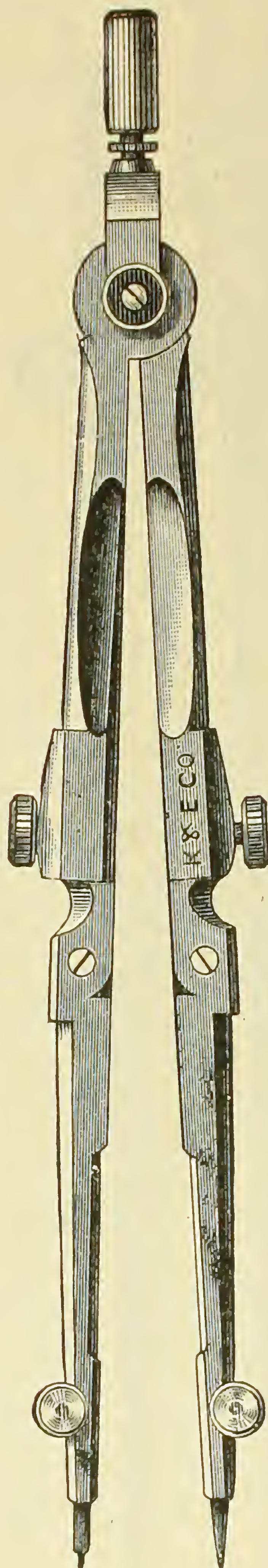
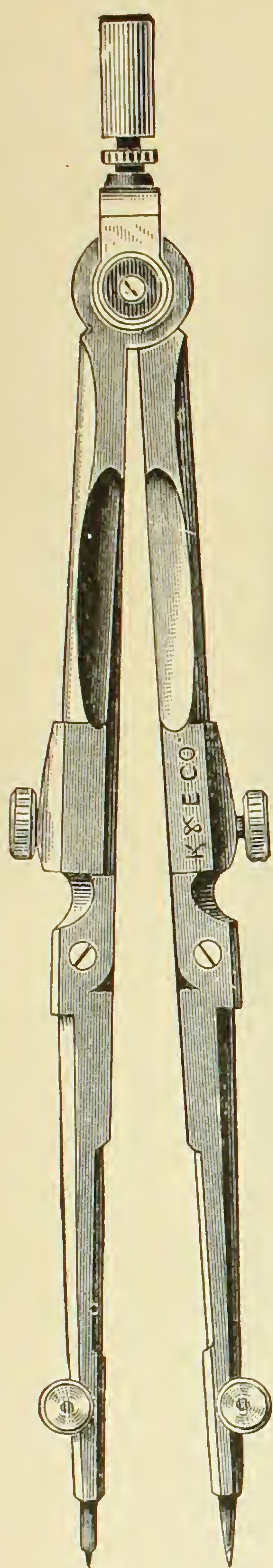
(See page 9.)



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y Paragon.



No. 610 H.

610 HD.

610 H. Compasses, $6\frac{1}{4}$ in. like No. 610, but with Hairspring . . each \$

610 HD. do. $6\frac{1}{4}$ " like No. 610H, but with improved
Dotting Pen with 6 wheels

610 K. Compasses, $6\frac{1}{4}$ in., with fixed Needle point, Knife Spring
Pen Point, Pencil Point and Lengthening Bar

The Knife Spring Paragon Bow Pens have a hinged upper blade actuated by a spring similar to a pocket knife, which either holds the pen open at 90 degrees or presses it firmly against the fixed blade. (See page 5.)

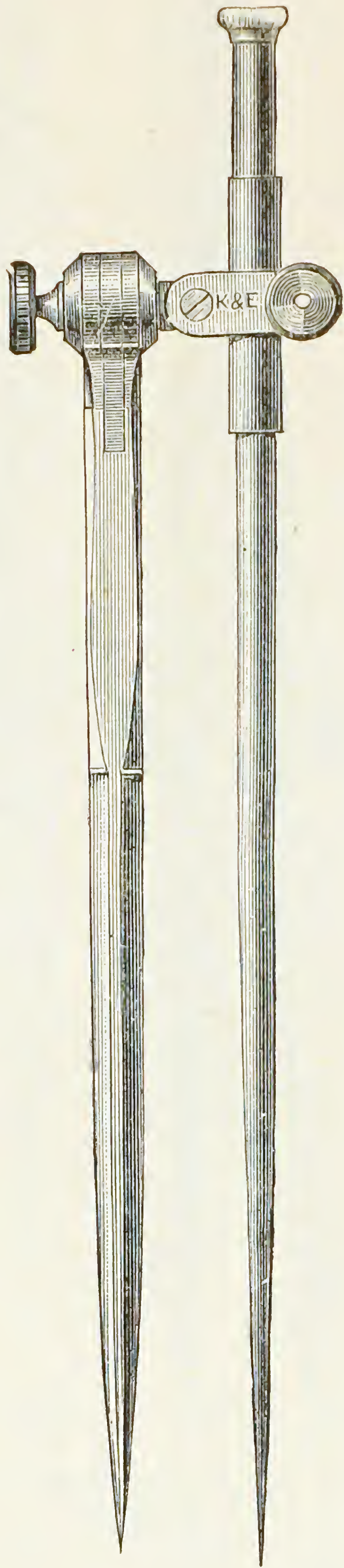
Opening the pen for cleaning does not change the adjustment for width of line.
For illustration of Knife Spring Pen, see page 28.



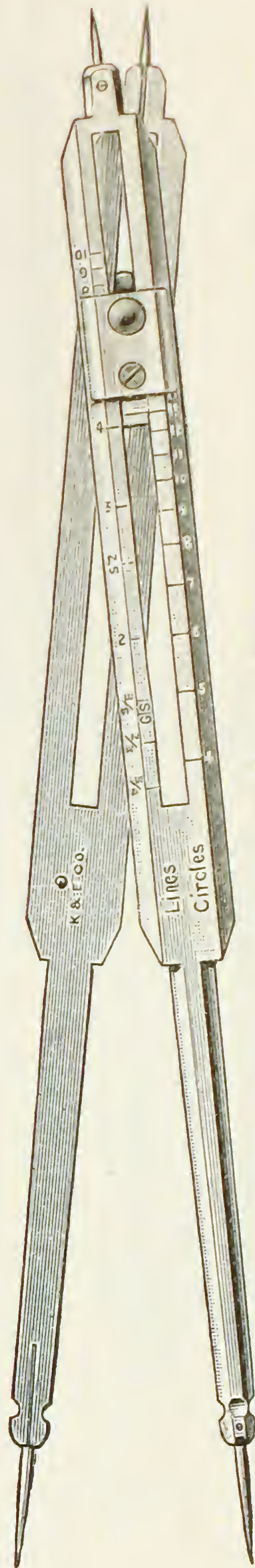
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 431.

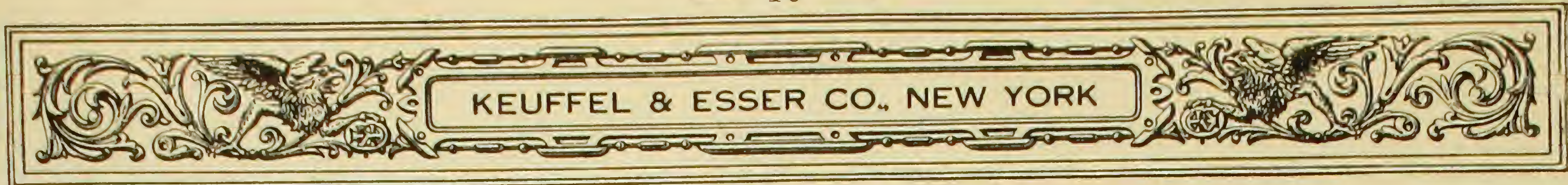


435.

431. Three-legged Dividers, one leg adjustable for length, 6 in., each \$

435. Proportional Dividers, finely divided for lines and circles,
7 $\frac{3}{4}$ in., “

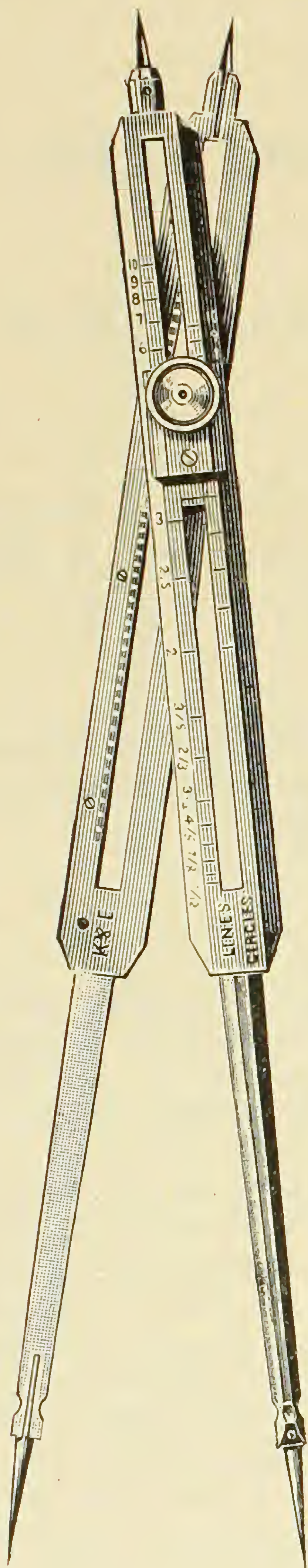
Morocco Case, silk velvet lined for 431 and 435. “



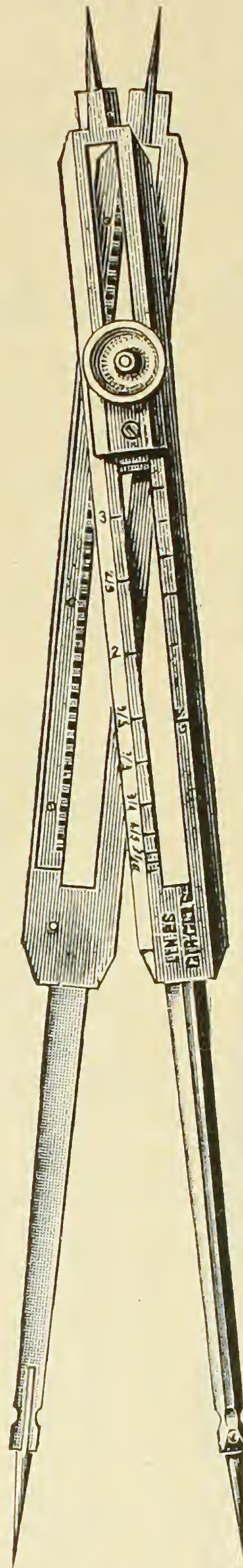
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 437.



439.

- 437. Proportional Dividers, finely divided for lines and circles,
 $9\frac{1}{4}$ in., with Rack Movement each
 Morocco Case, silk velvet lined “
- 439. Proportional Dividers, finely divided for lines and circles
 on one side and for planes and solids on the other
 side, $9\frac{1}{4}$ in., with Rack Movement “
 Morocco Case, silk velvet lined for 437 “
 “ “ “ “ “ “ 439 ”

Paragon Proportional Dividers have **Steel Legs** with **Adjustable Steel Points**.

KEUFFEL & ESSER CO., NEW YORK

PARAGON INSTRUMENTS.

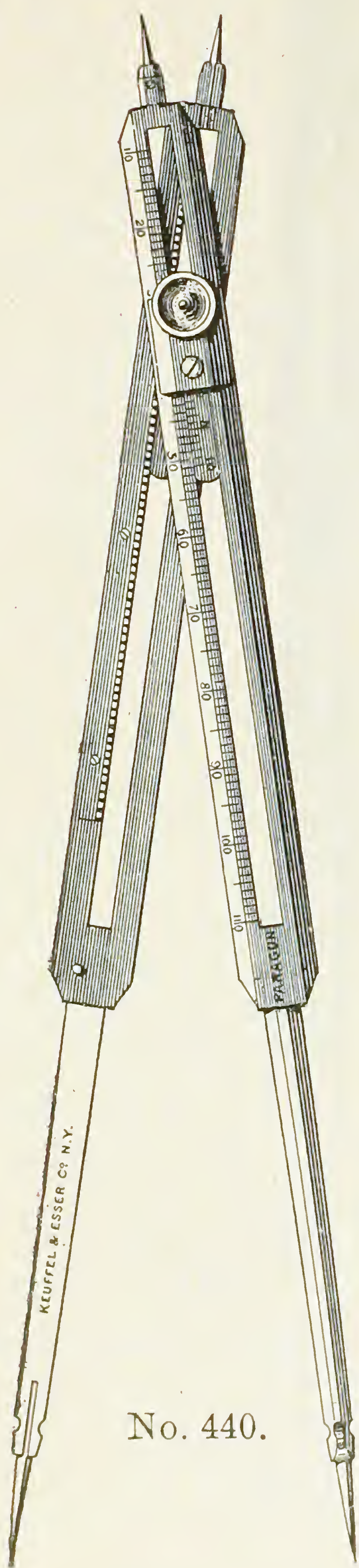
REG. U. S. PAT. OFF.

UNIVERSAL PROPORTIONAL DIVIDERS.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

440. Universal Proportional Dividers (Registered)
10 in., with Rack Movement, in Morocco
finish Case, with Table of Settings . . each \$

Paragon Proportional Divider No. 440 has steel legs with adjustable steel points which can be re-pointed without affecting the correctness of the instrument.



No. 440.

Divider No. 440 differs from the ordinary instrument of its kind in that its whole length is divided into 100 equal parts, which are further subdivided into tenths by means of a vernier. These graduations are not carried over the entire length of the instrument, because those seen in the figure from 10 to 110 reading with the vernier to 1000ths, are practically all that are necessary for the almost endless variety of purposes to which these Dividers may be applied. By this method of graduation any desired ratio between 1:1 and 1:11.5 may be set off. Thus, setting 483 (taken from many others in a table of settings which accompanies each instrument) gives the ratio between the diameter and the circumference of a circle; in other words, when the slide is set to this number by means of the vernier, the opening at one end will take in the diameter of a circle, and the opening between the points of the other end gives at once its circumference reduced to lineal measure. In like manner we have settings for such ratios as the diameter of a circle and the side of an equal square, feet and metres, yards and metres, etc. The list of settings for **Lines**, **Planes** and **Solids**, inclosed with each instrument, is much more complete than the series of fixed graduations on the best Dividers of the old style. The setting of the slide from such a table is effected more easily and more accurately than can be done by the ordinary method. By means of the fully graduated scale very small departures from a given ratio can be detected at once.

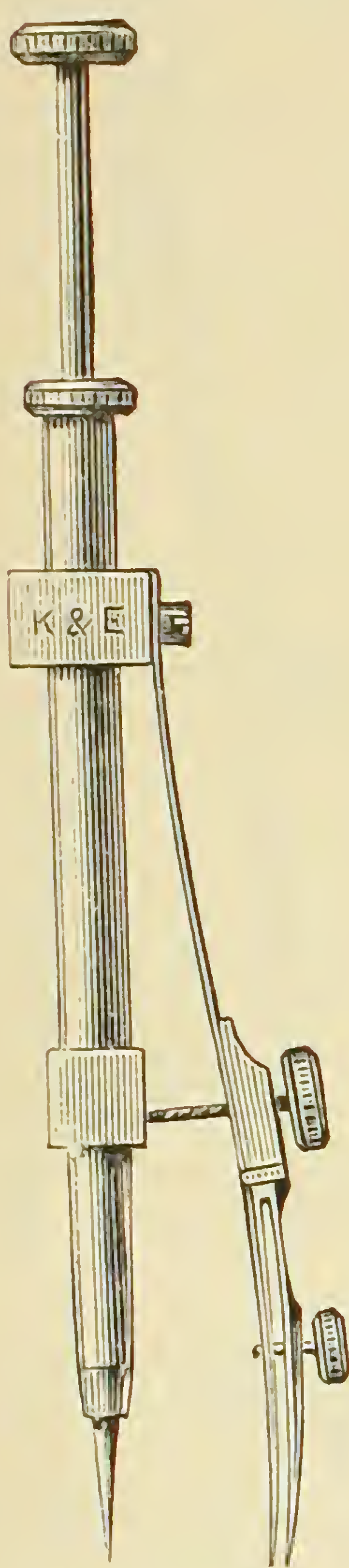
Any other desired setting not found in the list, may be obtained by means of a very simple formula given with the table of settings.



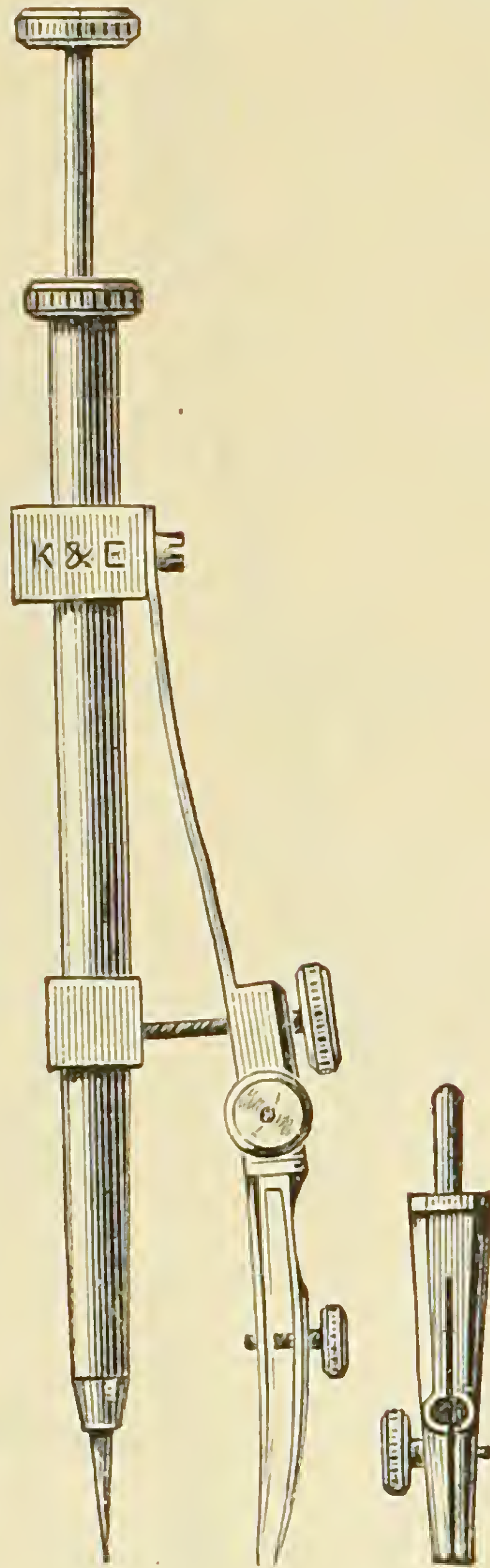
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

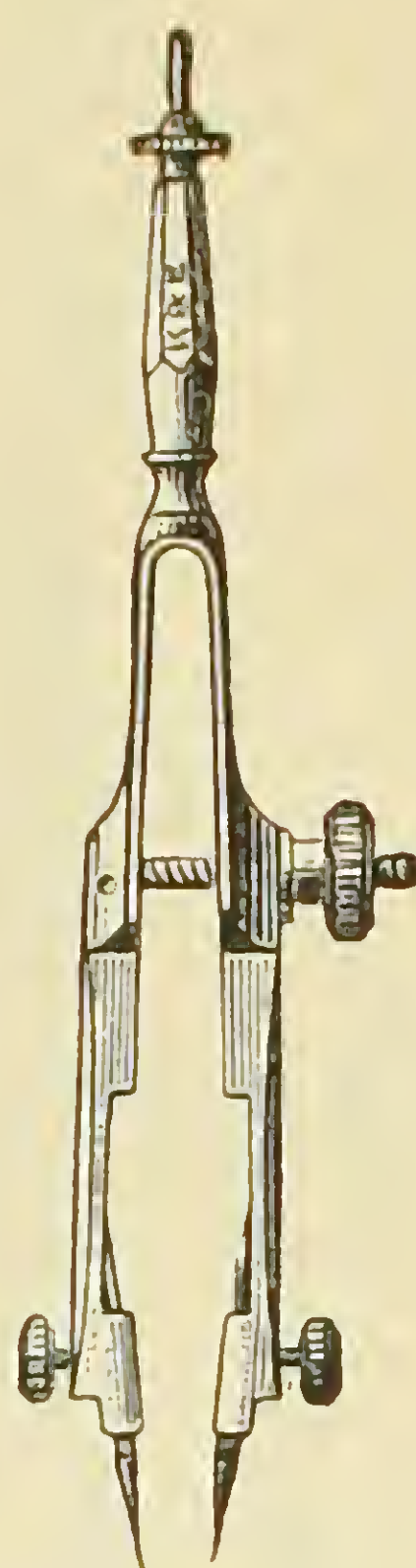
Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



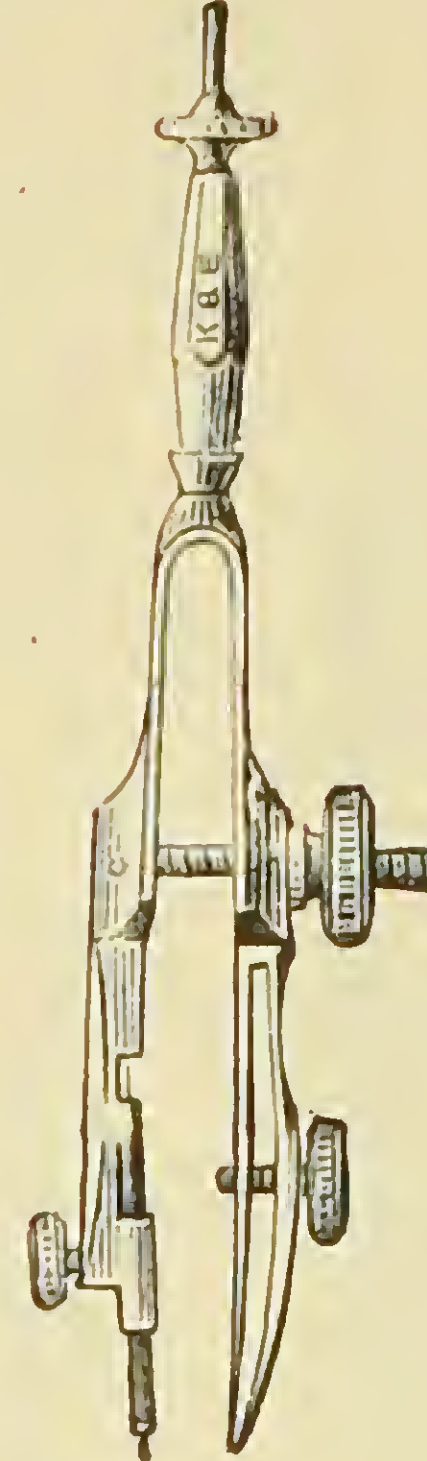
No. 453.



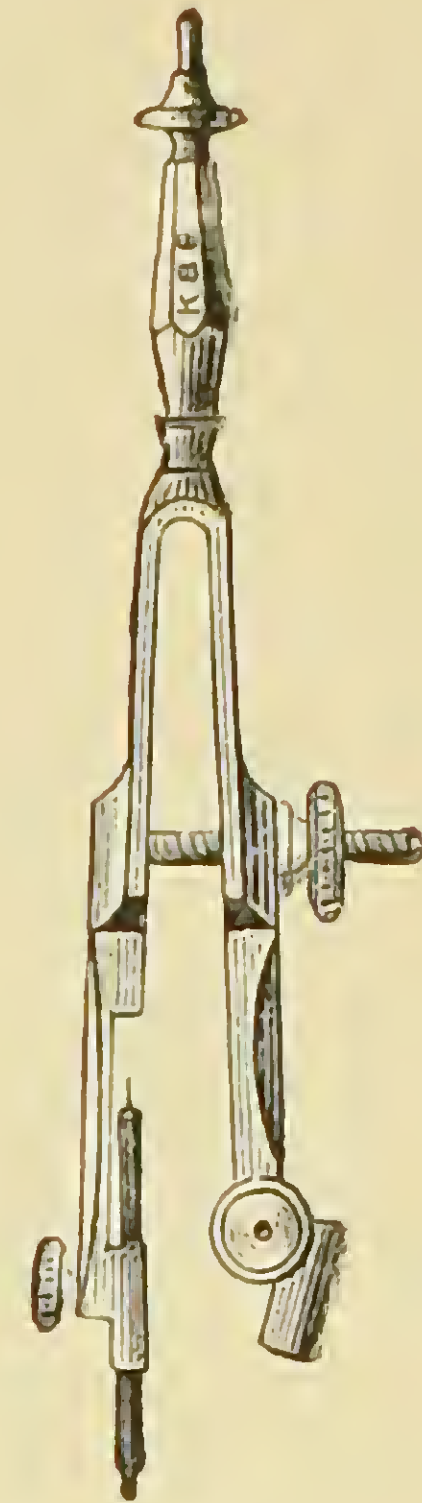
454.



460 $\frac{1}{2}$.



461 $\frac{1}{2}$.



462 $\frac{1}{2}$.

453. Drop Spring Bow Pen, 4 in., spring blade, for very small circles, each \$
Morocco Case, silk velvet lined “
454. Drop Spring Bow Pen, spring blade, and Pencil, 4 in., for
very small circles “
Morocco Case, silk velvet lined “
- 460 $\frac{1}{2}$. Minute Steelspring Bow Dividers, with 2 Needle Points,
Metal Handle, 2 $\frac{1}{4}$ in. “
- 461 $\frac{1}{2}$. “ “ “ Pen, spring blade, with Needle
Point, Metal Handle, 2 $\frac{1}{4}$ in. “
- 462 $\frac{1}{2}$. “ “ “ Pencil, with Needle Point, Metal
Handle, 2 $\frac{1}{4}$ in. “

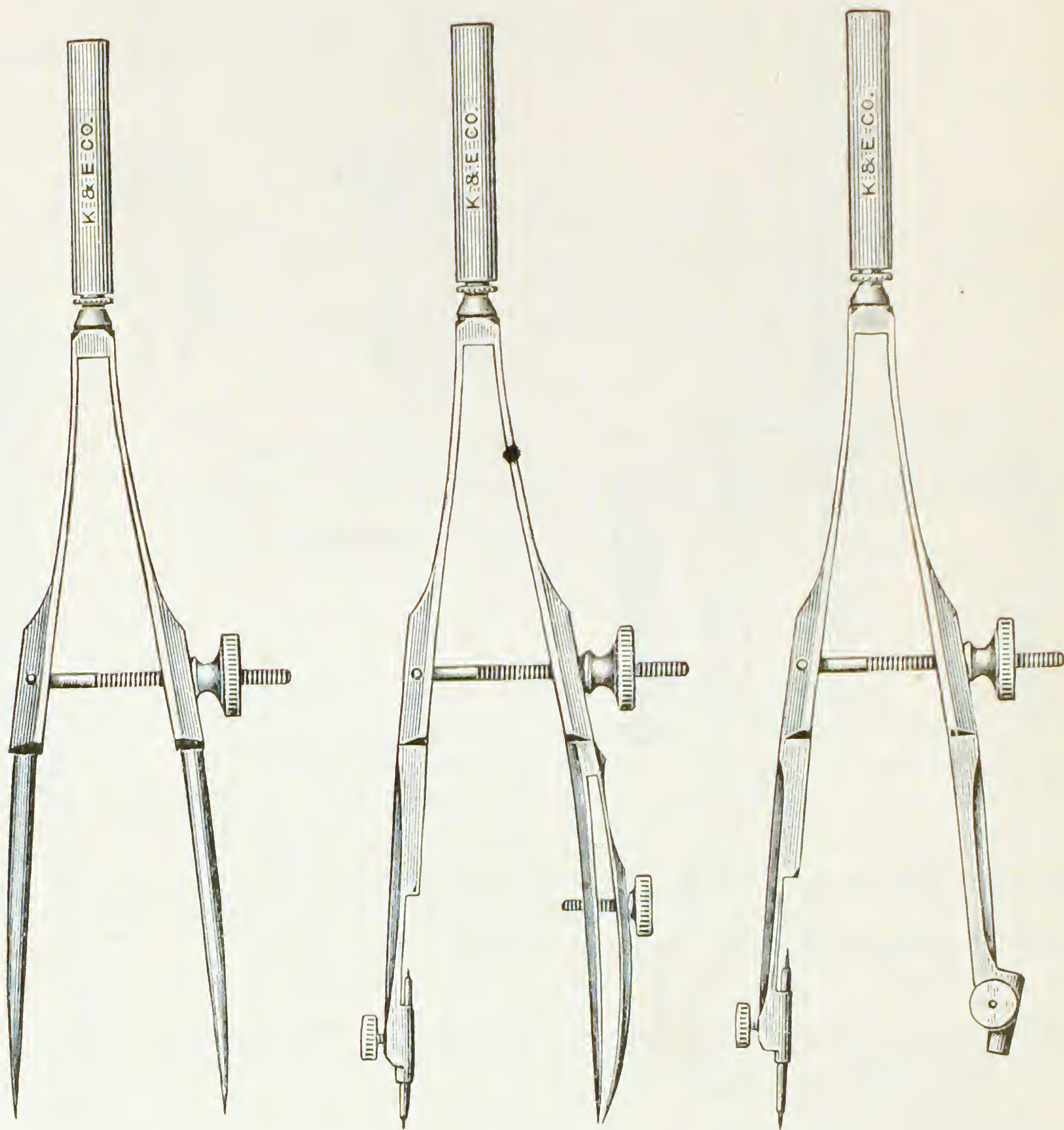
Nos. 453 and 454 are the most suitable instruments for drawing small circles. In these types the center rod remains stationary while the instrument is turned and pen or pencil draw by their own weight; this obviates slipping of the needle and scratching of the pen. (See page 13.)



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 476.

477.

478.

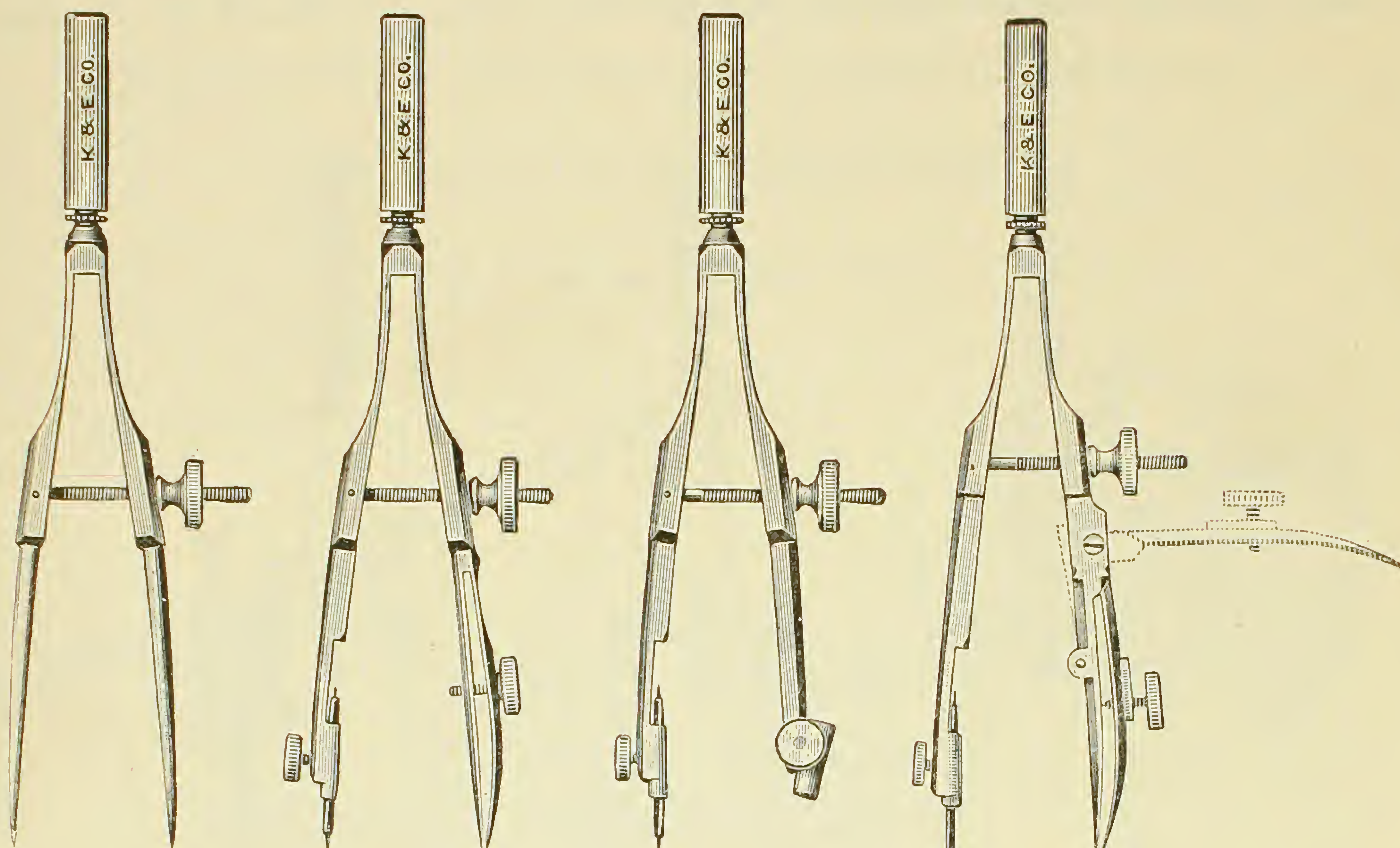
- | | | |
|------|---|----------------|
| 476. | Steelspring Bow Dividers, with nickel silver Handle, | 5 in., each \$ |
| 477. | “ “ Pen, spring blade, with Needle Point, nickel silver Handle, | 5 “ “ |
| 478. | “ “ Pencil, with Needle Point, nickel silver Handle . . . | 5 “ “ |



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 480.

481.

482.

481 K.

480. Steelspring Bow Dividers, nickel silver Handle, $3\frac{3}{4}$ in., each \$

481. " " Pen, spring blade, Needle Point,
nickel silver Handle $3\frac{3}{4}$ " "

482. " " Pencil, Needle Point, nickel
silver Handle $3\frac{3}{4}$ " each \$

481K. Steelspring Bow Pen, Knife Spring Pen, Needle Point,
nickel silver Handle $3\frac{3}{4}$ " "

The Knife Spring Paragon Bow Pens have a hinged upper blade actuated by a spring, as in a pocket knife, which either holds the pen open at 90 degrees or presses it firmly against the fixed blade. (See page 5.)

Opening the pen for cleaning does not change the adjustment for width of line.
For illustration of Knife Spring Pen, see page 28.

480 $\frac{1}{2}$. Steelspring Bow Dividers, nickel silver Handle, $3\frac{1}{4}$ in., each \$

481 $\frac{1}{2}$. " " Pen, spring blade, Needle Point,
nickel silver Handle $3\frac{1}{4}$ " "

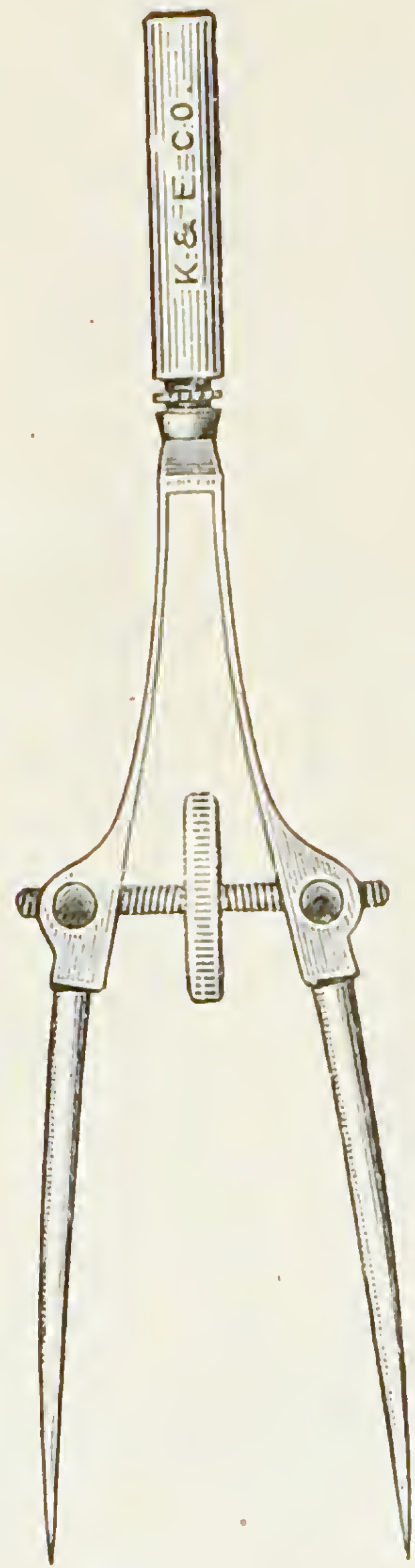
482 $\frac{1}{2}$. " " Pencil, Needle Point, nickel
silver Handle $3\frac{1}{4}$ " "



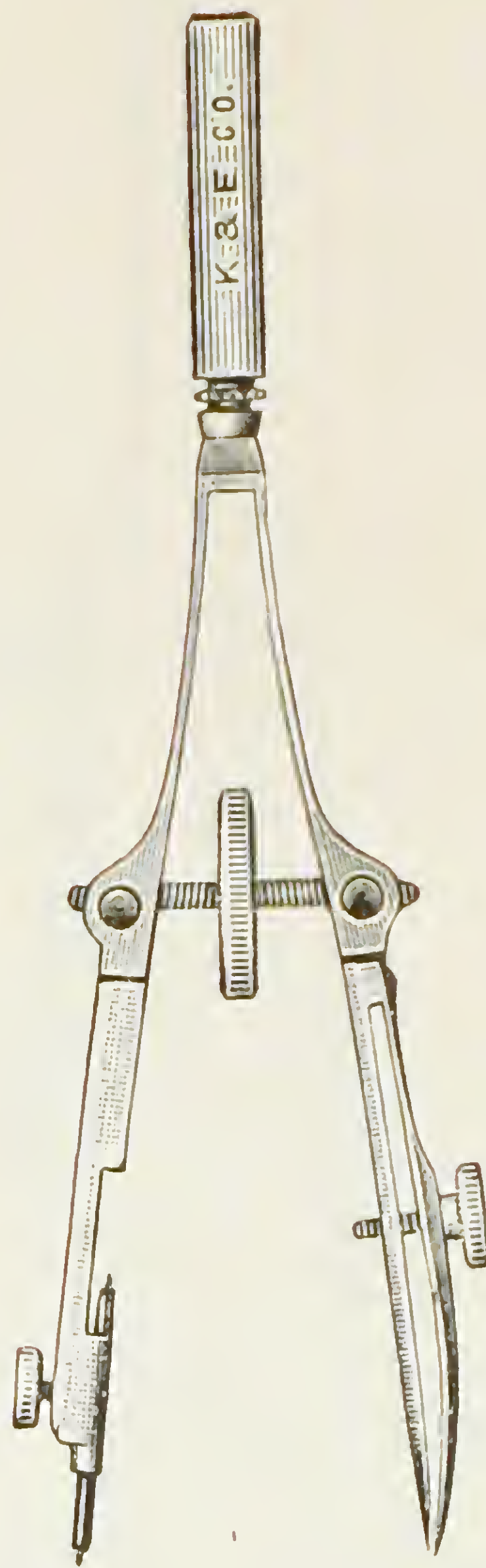
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

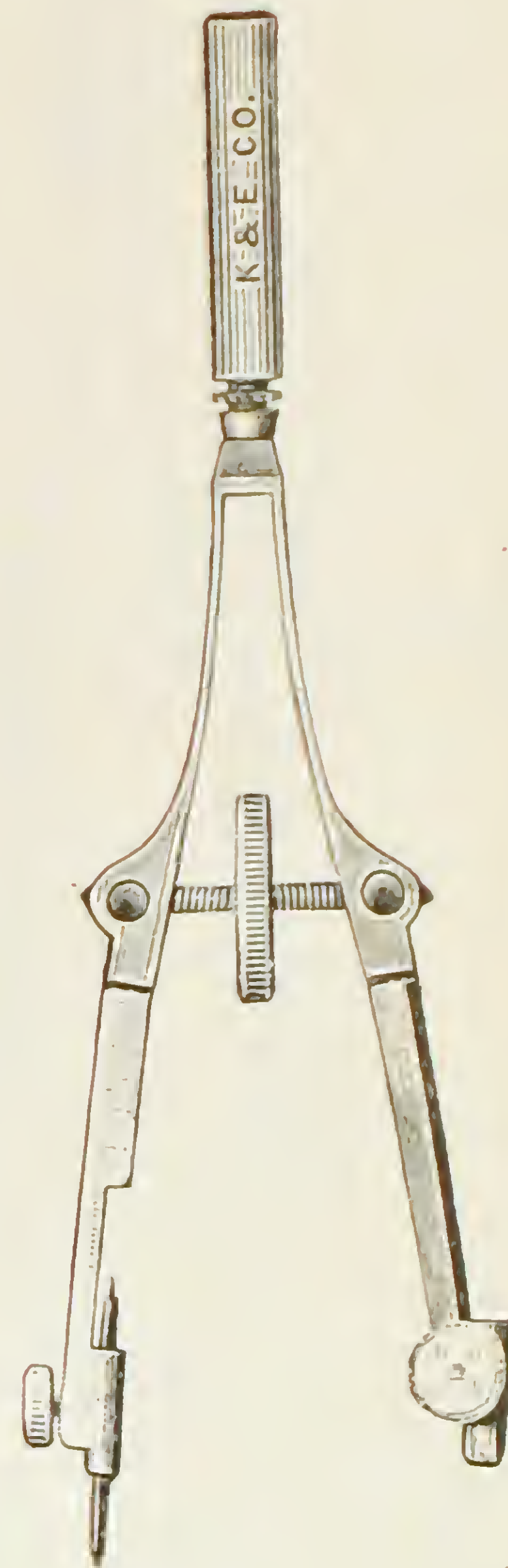
Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 485.



486.



487.

- 485. Steelspring Bow Dividers, with central thumbnut, nickel silver Handle, $3\frac{3}{4}$ in., each \$
- 486. Steelspring Bow Pen, spring blade, central thumbnut, with Needle Point, nickel silver Handle, $3\frac{3}{4}$ in., “
- 487. Steelspring Bow Pencil, central thumbnut, with Needle Point, nickel silver Handle, $3\frac{3}{4}$ in., “

Steelspring Bows Nos. 485, 486 and 487 are opened and closed by a right and left thread, which is operated by one thumbnut situated between the shanks of the instrument; this thread also holds the points rigidly and doubles the speed of the screw. (See page 13).

- 486K. Steelspring Bow Pen, central thumbnut, Knife Spring Pen, Needle Point, nickel silver Handle, $3\frac{3}{4}$ in., each \$

The Knife Spring Paragon Bow Pens have a hinged upper blade actuated by a spring similar to a pocket knife, which either holds the pen open at 90 degrees or presses it firmly against the fixed blade. (See page 5).

Opening the pen for cleaning does not change the adjustment for width of line. For illustration of Knife Spring Pen, see page 28.



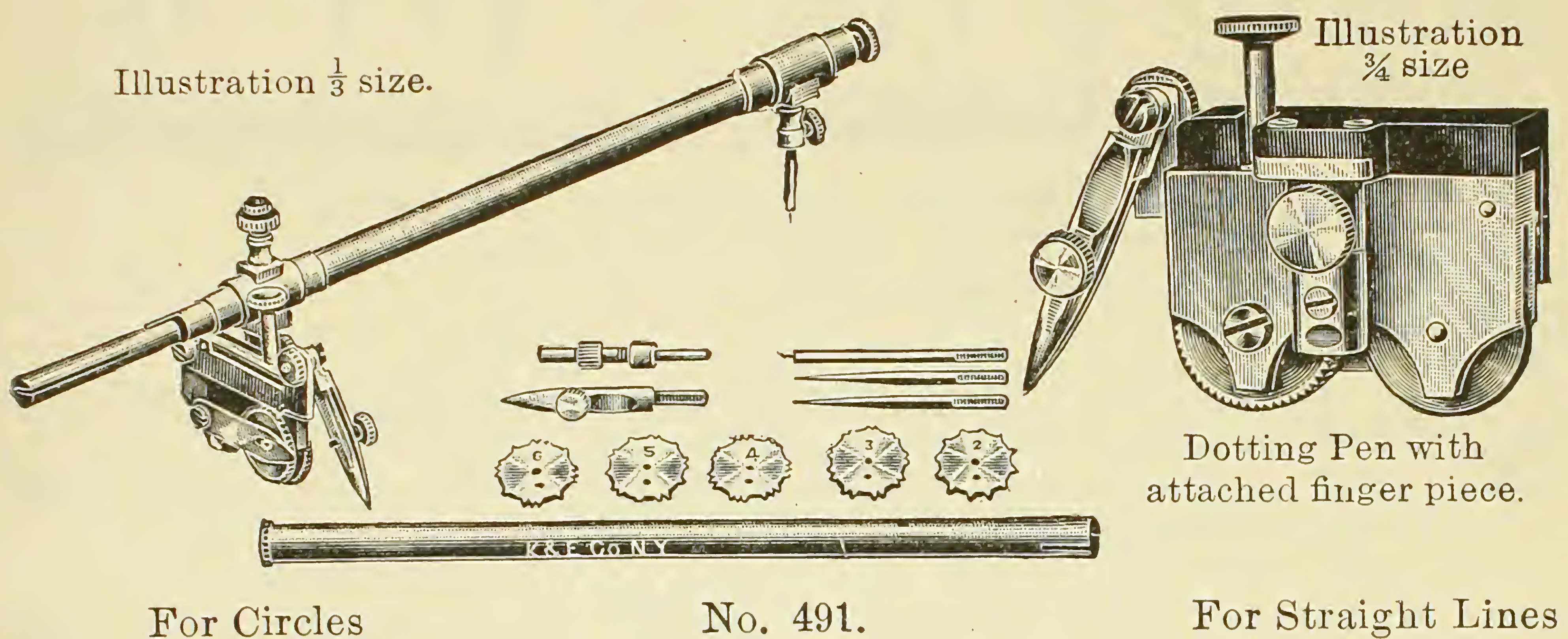
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

PARAGON DOTTING INSTRUMENT AND BEAM COMPASS

For Circles and Straight Lines.

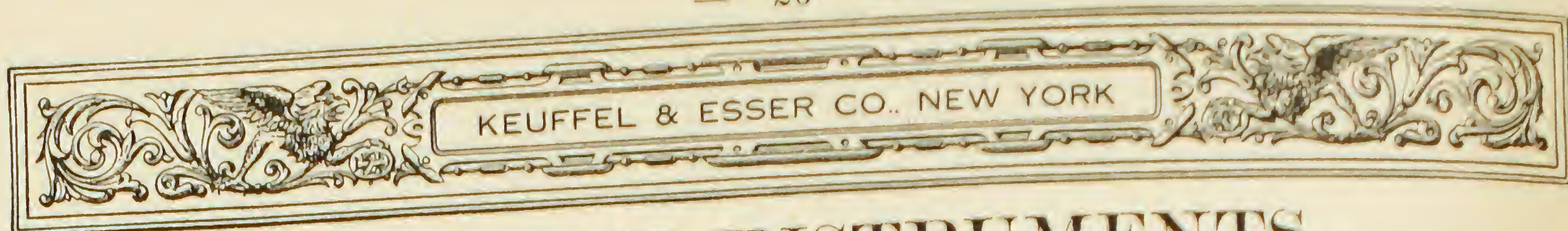


491. Paragon Dotting Instrument, nickel silver, 12 in.,
2 Round Bars, Dotting Pen, Pen and Pencil Points,
(the Pen Points have Spring Blade) 2 Steel Needle
Points, 1 Shouldered Needle for use with Dotting
Pen, 1 Shouldered Needle for use with Pen or
Pencil Point, Micrometer Adjustment. In velvet
lined morocco Case, with bar lock each \$

This instrument for drawing dotted circles and straight lines is of practical construction and does good work. The propelling and supporting wheels of the dotting pen travel on the drawing and are, therefore, not so liable to slip as those which travel on a straightedge. For dotting circles, the dotting pen is clamped to the bar; for dotting straight lines, along a straightedge, there is a finger piece, for attachment to the dotting pen; this also serves as a handle.

There are 6 ratchet wheels which are readily interchangeable by lifting the flat spring which holds them on their pivots. They produce the following patterns:

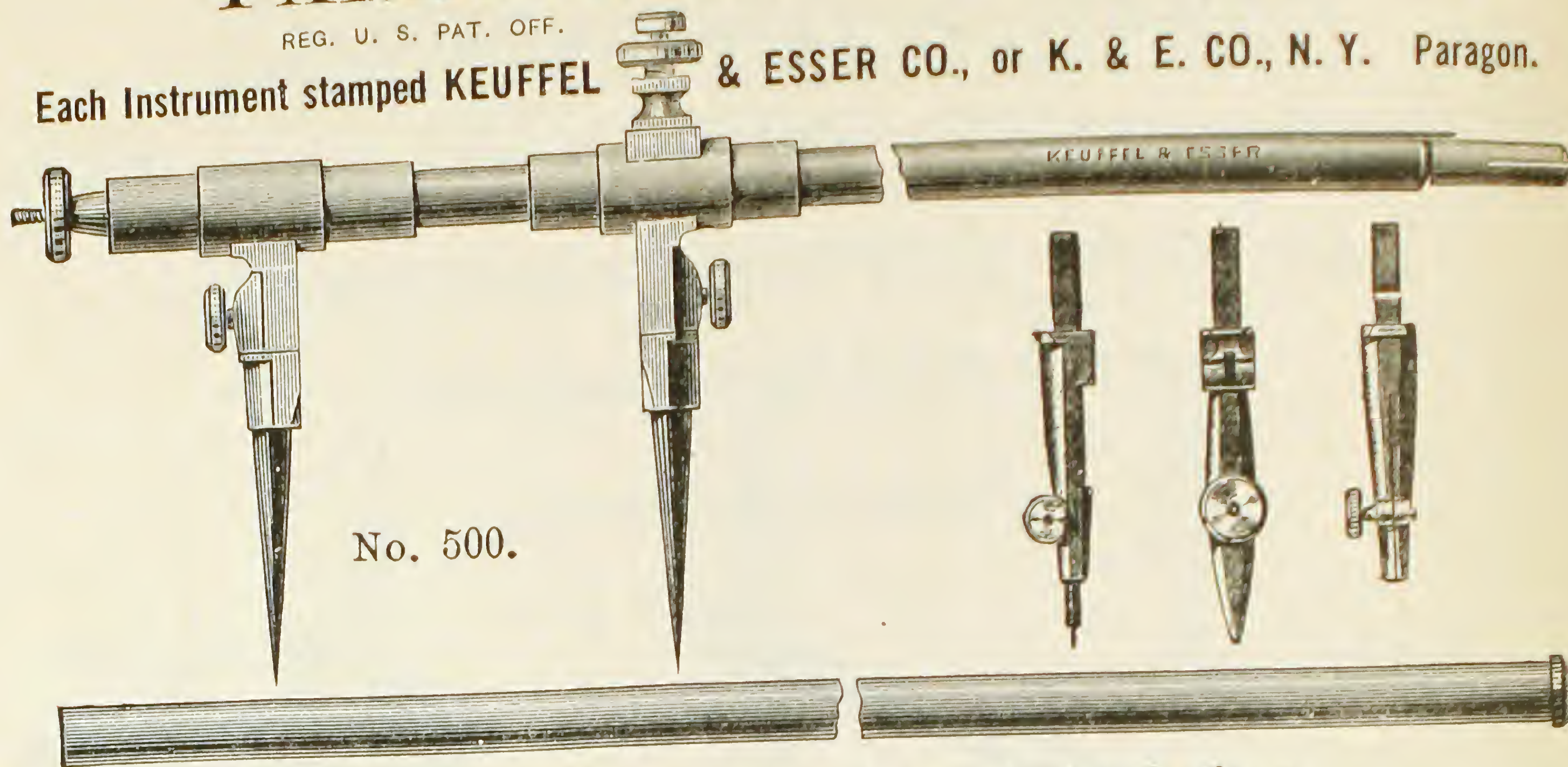
Nº 1	-----	Nº 4	-----
" 2	-----	" 5	-----
" 3	-----	" 6	-----



PARAGON INSTRUMENTS.

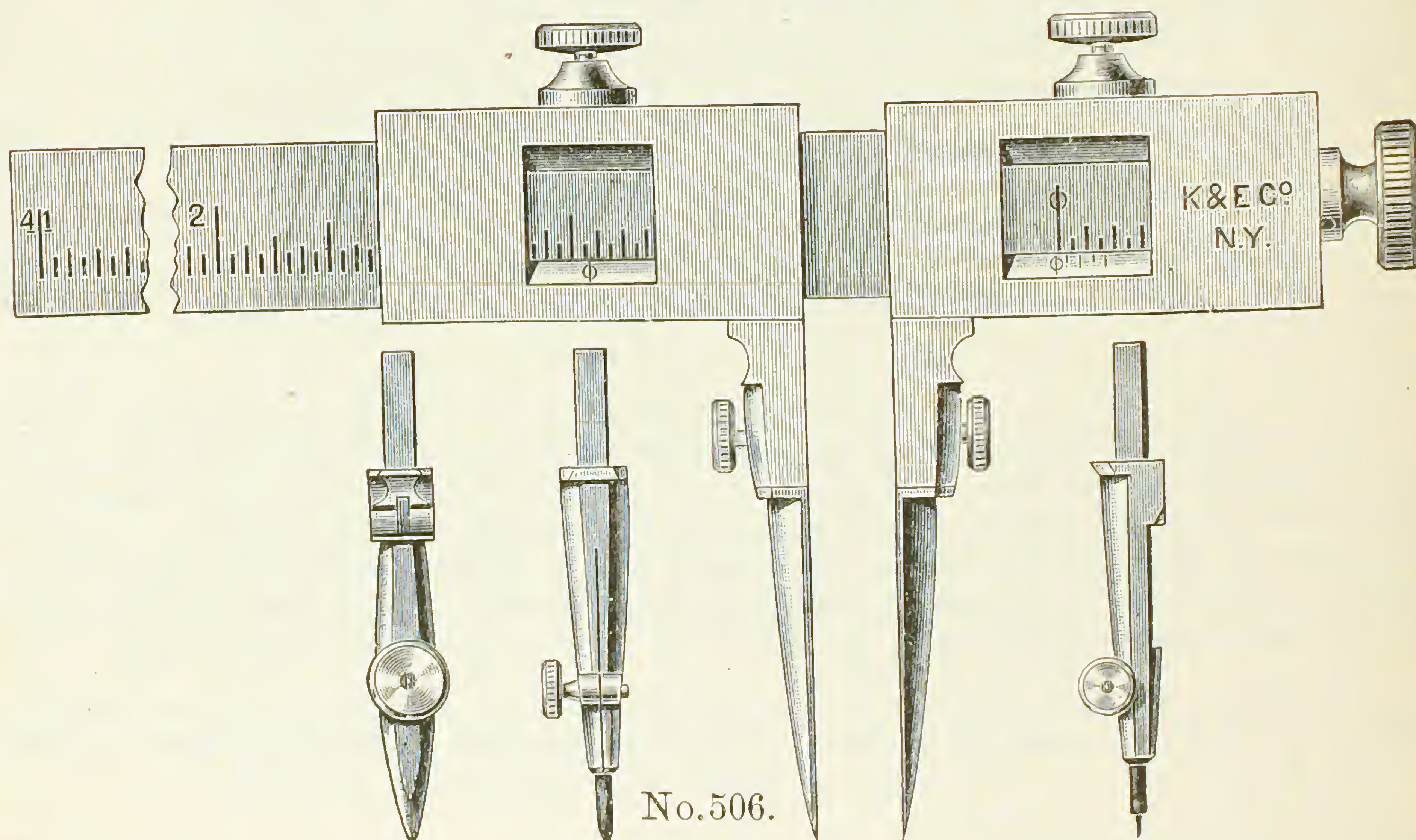
REG. U. S. PAT. OFF.

Each Instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 500.

500. Tubular Beam Compasses, 18 in., 2 round nickel silver Bars, 2 Steel Points, Pen, Pencil and Needle Point, Micrometer Adjustment each \$
501. do. do. do. do. 27 in., 3 Bars "
502. do. do. do. do. 38 " 3 " "
- The bar of No. 502 is heavier than those of the smaller sizes.
503. Wheel Attachment for No. 500 or 501 "
504. " " " " 502 "
- Morocco Case, silk velvet lined, for No. 500,
 " Nos. 500 & 503 combined
 " No. 501
 " Nos. 501 & 503 combined
 " No. 502
 " Nos. 502 & 504 combined



No. 506.

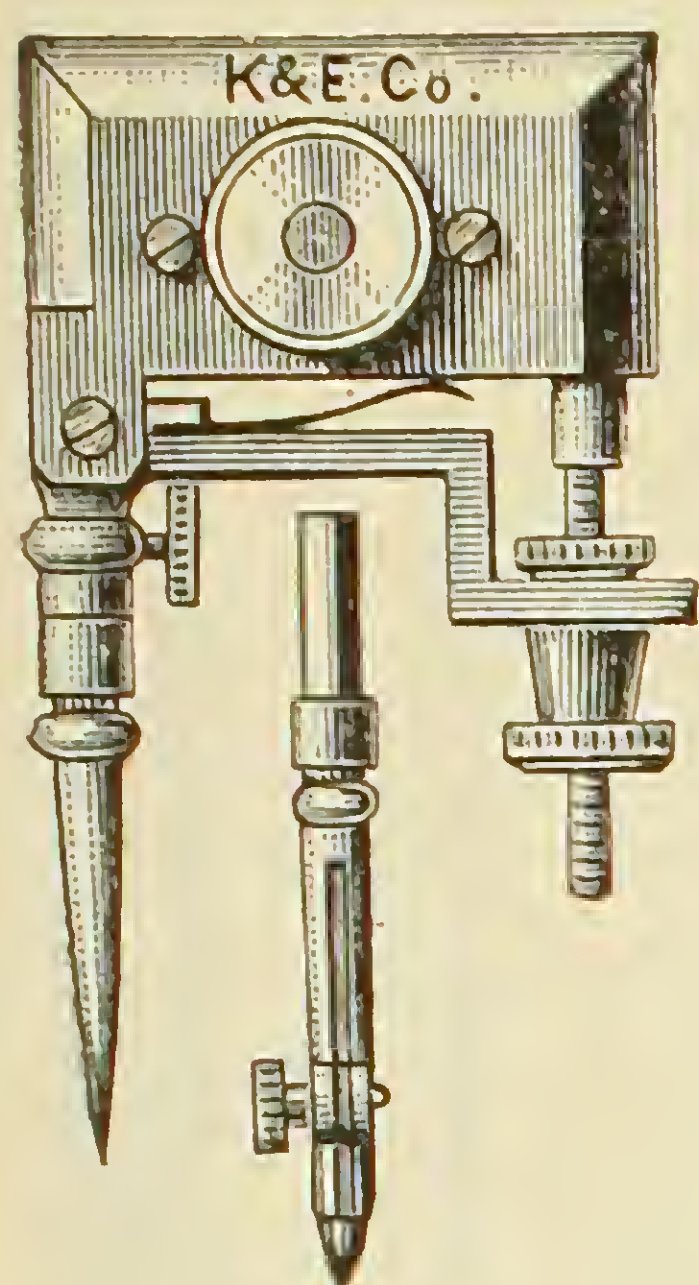
506. Beam Compasses with Rectangular Tubular Bar of nickel silver, Pen, Pencil and Needle Point, 2 Steel Points, Wheel Attachment, Micrometer Adjustment. Bar 44 in. long, divided to $\frac{1}{20}$ inch and by vernier to $\frac{1}{200}$ inch; and 1 meter to millimeters and by vernier to $\frac{1}{10}$ millimeter. Instrument in morocco finish Case, each \$



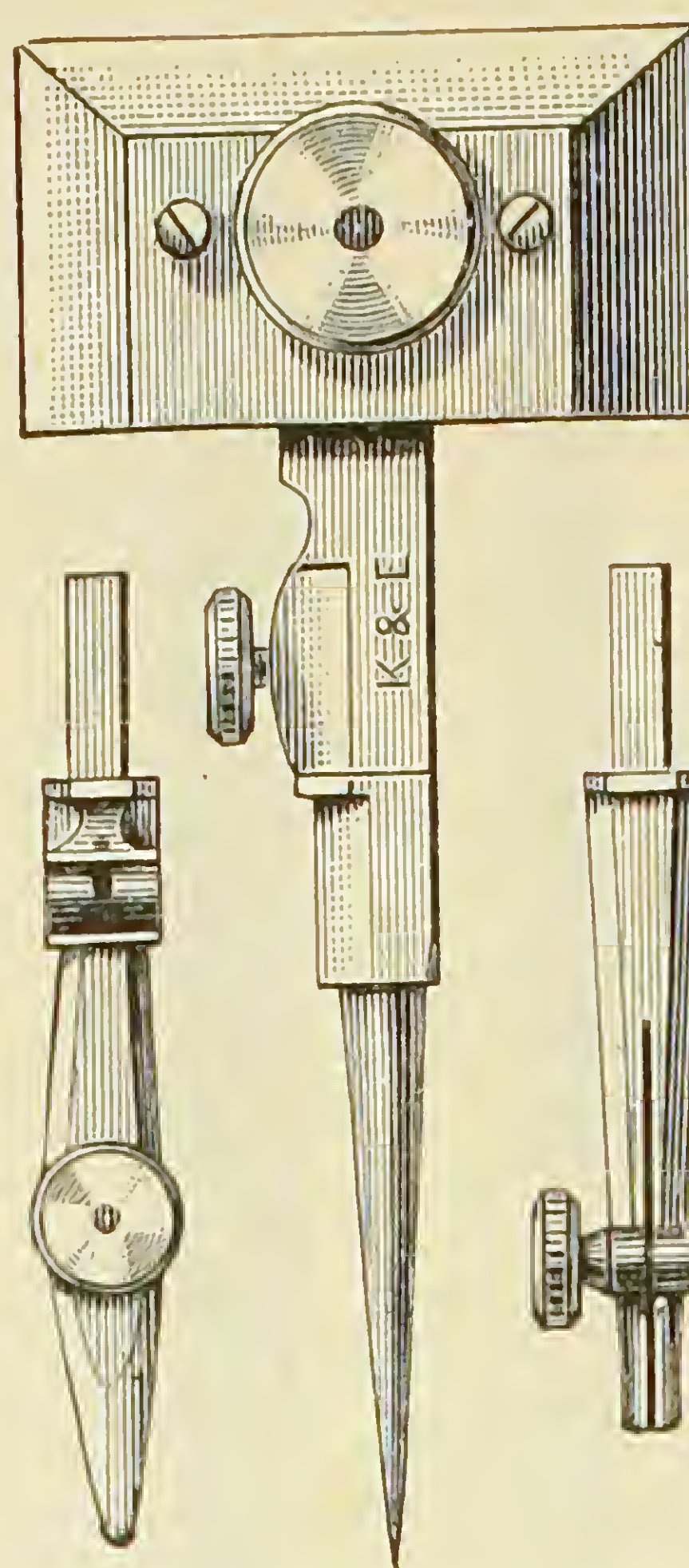
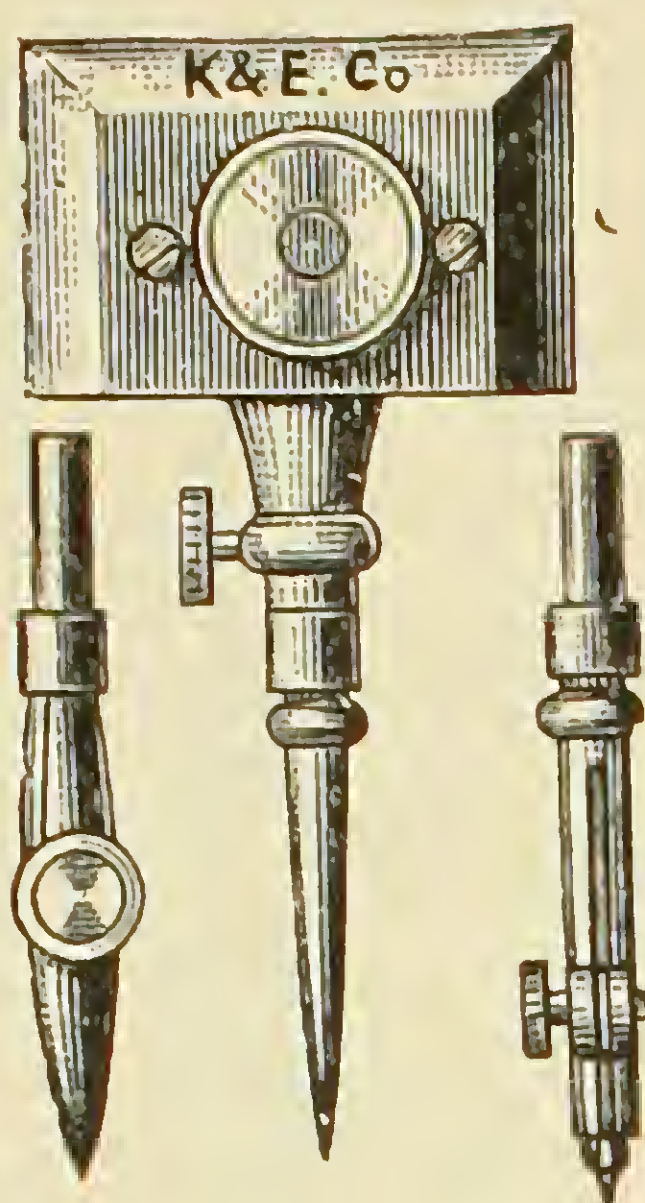
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

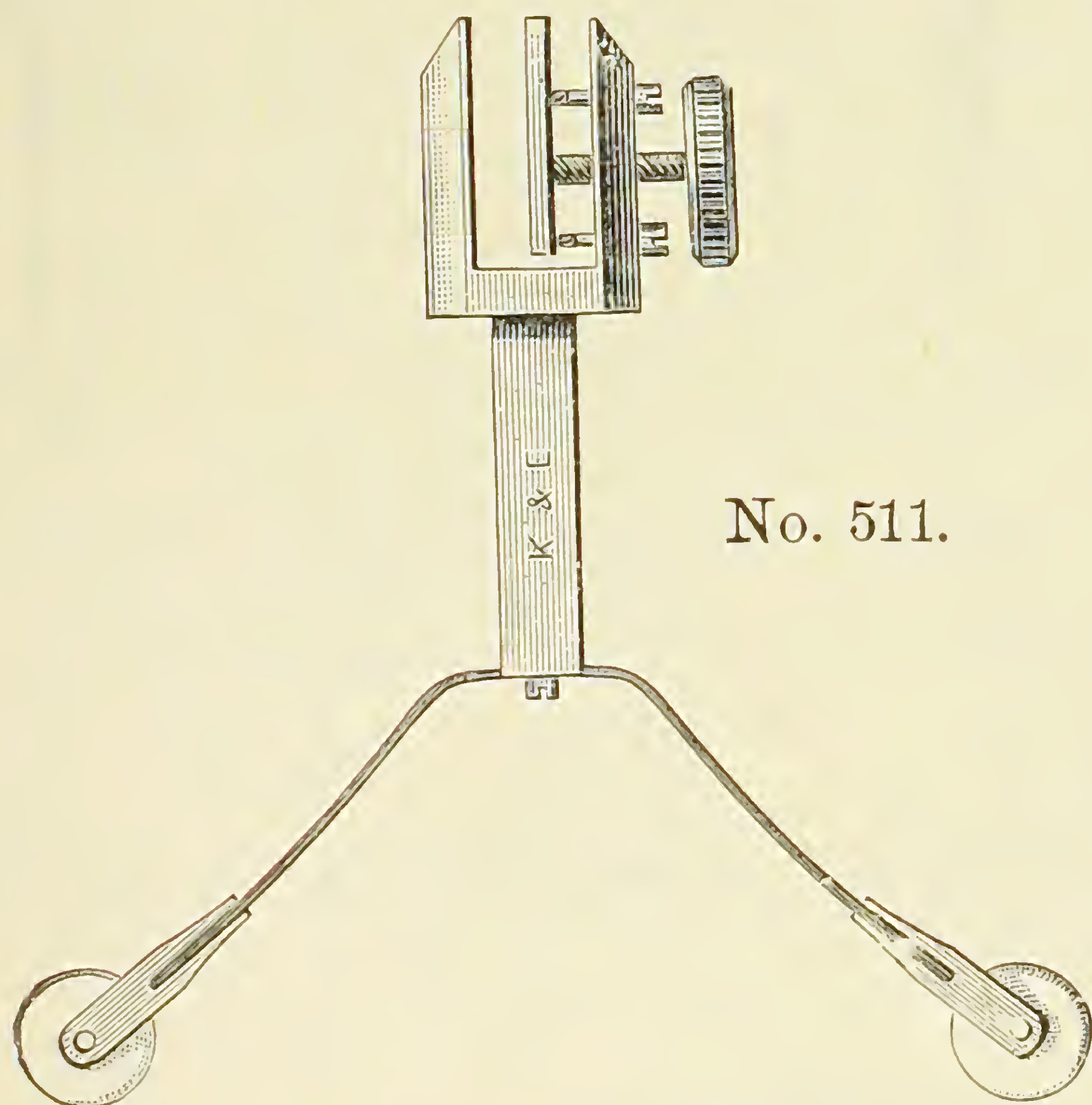


No. 509

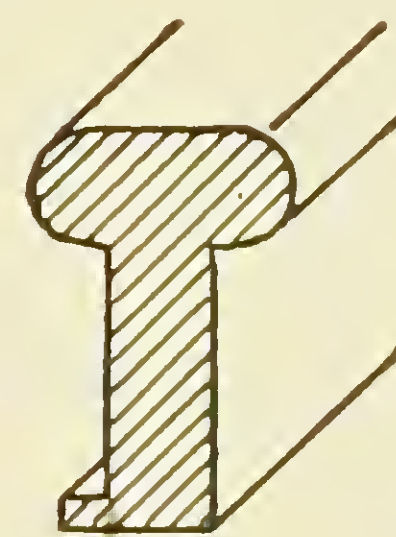


No. 510.

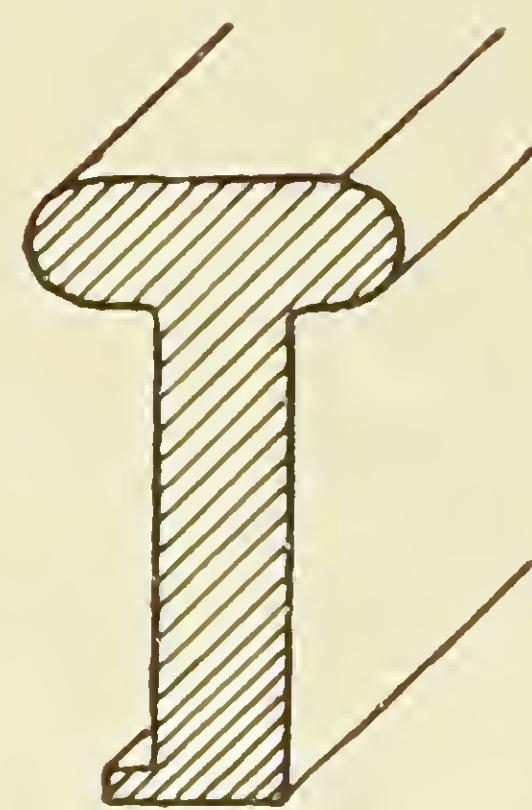
- | | | |
|-------|--|---------|
| 509. | Minute Beam Compasses with 2 Steel Points, Pen, Pencil and Needle Point, Micrometer Adjustment | each \$ |
| 509½. | Wheel Attachment for No. 509 (for illustration see No. 511) | " |
| | Morocco Case, silk velvet lined, for No. 509 | " |
| | do. do. " " " " " 509 with No. 509½ | " |
| 510. | Beam Compasses with 2 Steel Points, Pen, Pencil and Needle Point, Micrometer Adjustment | " |
| | Morocco Case, silk velvet lined, for No. 510 | " |



No. 511.



No. 2280.
½ in. thick.



2282.
¼ in. thick.

- | | | |
|-------|--|---------|
| 511. | Wheel Attachment for No 510 | each \$ |
| | Morocco Case, silk velvet lined, for Nos. 510 & 511 combined | " |
| 2280. | Hardwood Bars for Beam Compasses No. 509. | |
| | 24 30 36 42 48 60 in. | |
| | each \$ | |
| 2282. | Hardwood Bars for Beam Compasses Nos. 510 and 854, | |
| | 24 30 36 42 48 60 in. | |
| | each \$ | |

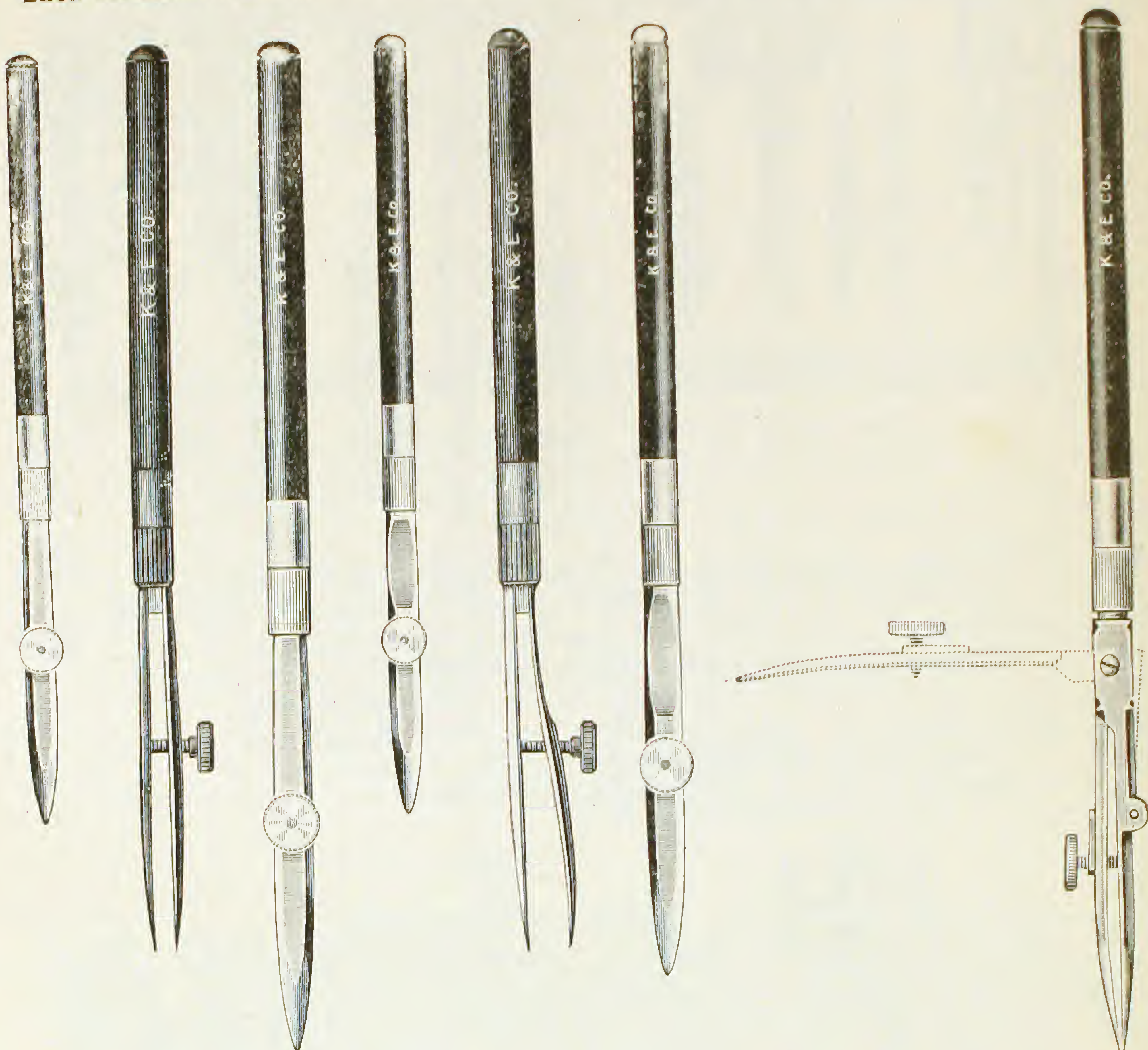
In ordering these bars, please state catalogue number of beam compasses.



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No.	520.	521.	521½.	522.	523.	523½.	524 K.
520.	Drawing Pen, Ebony Handle, 4½ in.	each	\$				
521.	"	"	"	"	5 "	"	"
521½.	"	"	"	"	5½ "	"	"
522.	"	"	"	"	upper blade with spring, 4½ in.	"	"
523.	"	"	"	"	"	"	5 "
523½.	"	"	"	"	"	"	5½ "

KNIFE SPRING PARAGON DRAWING PENS.

522 K.	Knife Spring Paragon Drawing Pen, Ebony Handle, 4½ in., . each	\$
523 K.	do. do. do. do. do. " " 5 "	"
524 K.	do. do. do. do. do. " " 5½ "	"

The Knife Spring Paragon Pens have a hinged upper blade actuated by a spring similar to a pocket knife, which either holds the pen open at 90 degrees or presses it firmly against the fixed blade. (See page 5).

Opening the pen for cleaning does not change the adjustment for width of line.

Above Pens with Aluminum Handle, are furnished at the same prices.

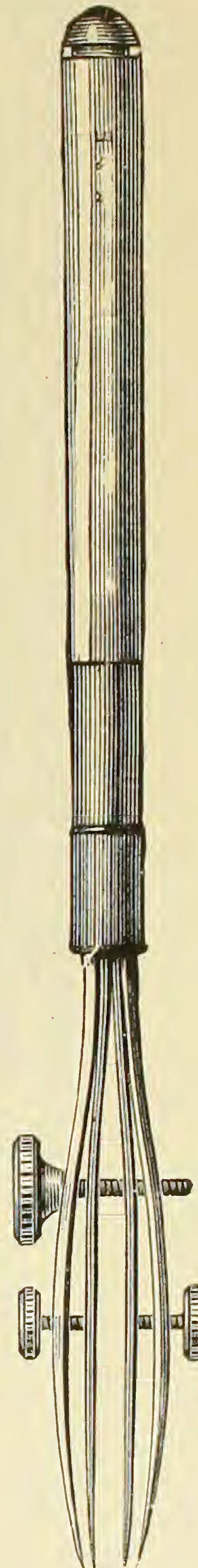
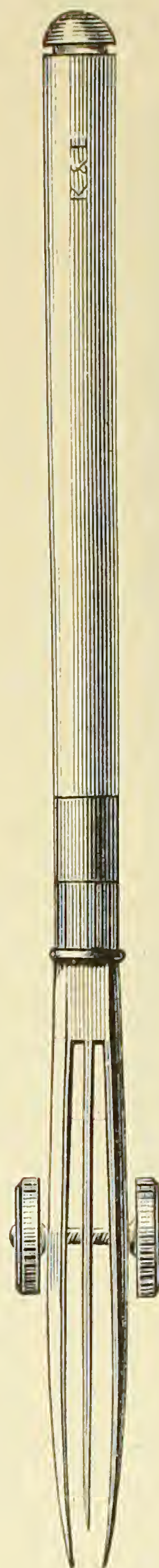
Drawing Pens carefully set and sharpened each \$



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 526.

527.

528.

535.

536.

526.	Drawing Pen with Joint, Ivory Handle, 4 in.	each	\$
527.	“ “ “ “ and Pin, Ivory Handle, 5 in.	“	
528.	“ “ “ “ “ “ “ “ 5½ “	“	
530.	“ “ “ “ “ “ “ “		
	nickel silver blades, for red ink, 5½ “	“	
535.	Border Pen, for broad lines, Ivory Handle	6½ “	“
536.	“ “ “ “ “ “ “ “ improved 6½ “	“	

Above Pens with Aluminum Handle, are furnished at the same prices.

Border Pen No. 536 may be used also as Railroad Pen by filling only the two pairs of blades with ink.



PARAGON INSTRUMENTS.

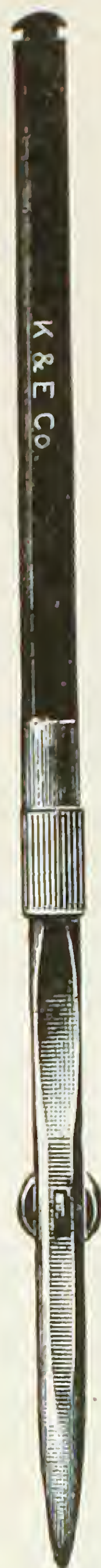
REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

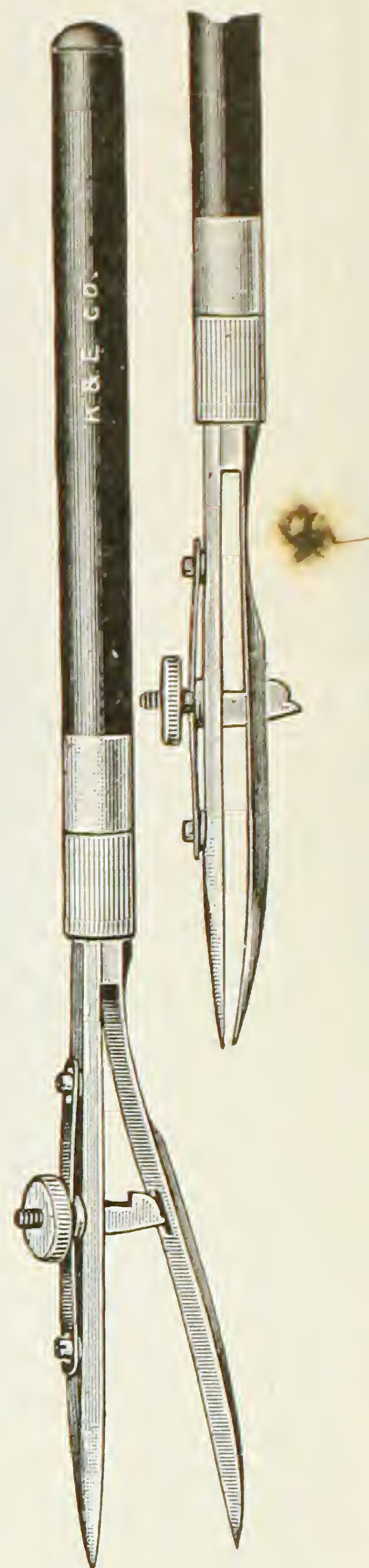
PATENT PARAGON DRAWING PENS.



No. 537.



538.



539.

- | | | | | | | | | | | |
|------|-------|---------|---------|------|-----------|-------|---------|---------|------|----|
| 537. | Click | Paragon | Drawing | Pen, | Patented, | Ebony | Handle, | 4½ in., | each | \$ |
| 538. | do. | do. | do. | do. | " | " | " | 5 | " | " |
| 539. | do. | do. | do. | do. | " | " | " | 5½ | " | " |

Above Pens with Aluminum Handle, are furnished at the same prices.

The Click Patent Paragon Drawing Pens possess all the excellent qualities which have made our Paragon Pens famous. In addition they can be returned to their exact original setting after having been opened (for cleaning) while at work on a drawing.

In the Click Pens. Nos. 537 to 539 the lug bearing the thread for the thumb nut ends in a steel hook which passes through a slot in the other blade, and is kept in place by a spring. The pen is opened by pushing the hook off its bearing, and is restored to its original setting by pressing the blade down, when the hook catches automatically. (See page 4).

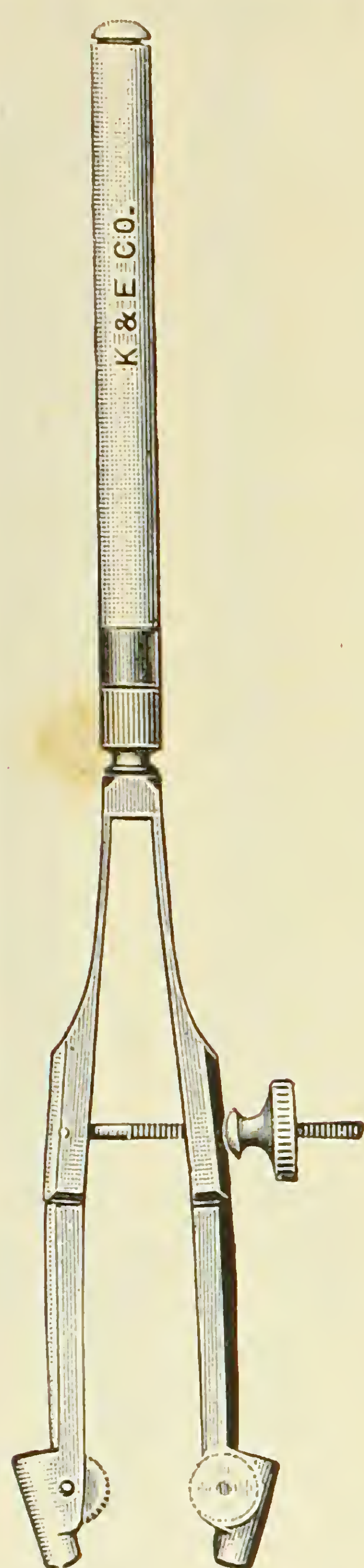
Drawing Pens carefully set and sharpened each \$



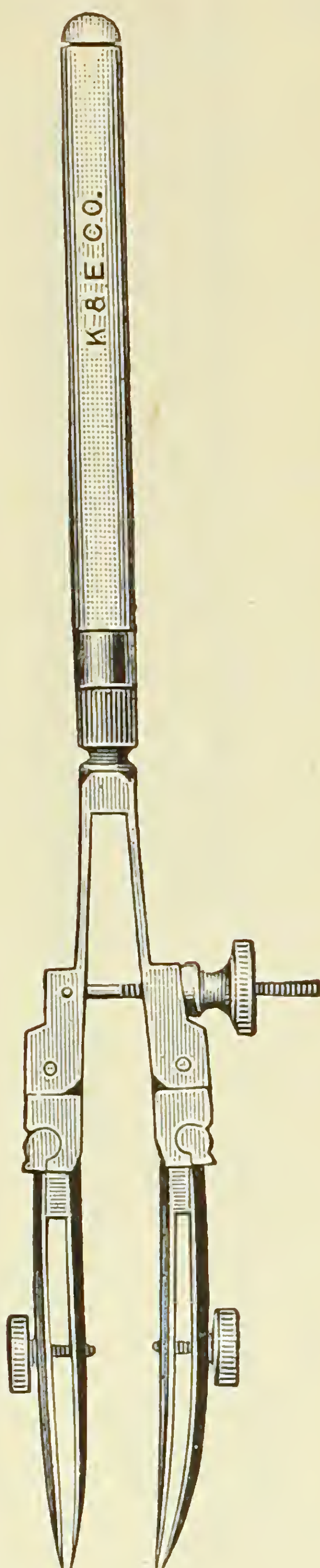
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 543.



545.



551.



556.

543. Railroad Pencil, Ivory Handle, 5 in. each \$

545. Railroad Pen with Joints to blades and in shanks,
K & E improved, Ivory Handle, 5 in. “

The improvement consists in having both pens bent in the same direction, so that lines can be drawn against a straightedge or rule as readily as with a ruling pen.

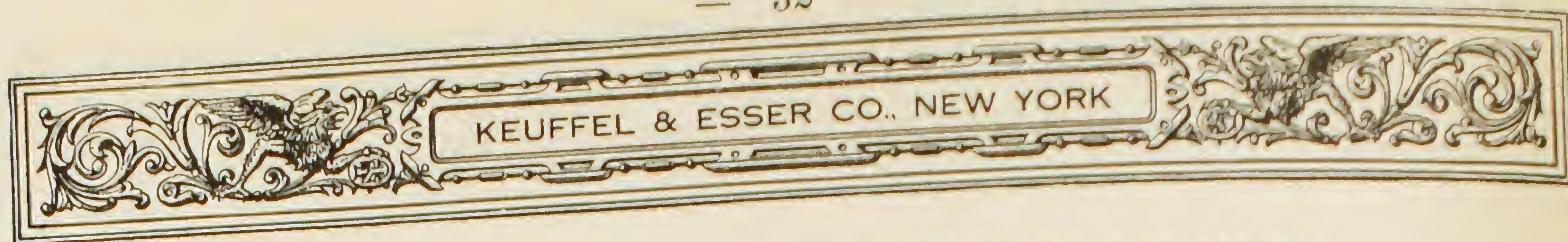
551. Dotting Pen with 6 Wheels, Ivory Handle, improved, 6 in. “

The improved Dotting Pen No. 551, is doubtless the best pen for the purpose, as it entirely prevents blotting, provided the ink is not too thin. The reservoir, after being filled, is closed and supplies no more ink to the dotting wheel than is actually required.

556. Tracer, Ivory Handle 5 in. “

Above instruments with Aluminum Handle, are furnished at the same prices.

Drawing Pens carefully set and sharpened each \$

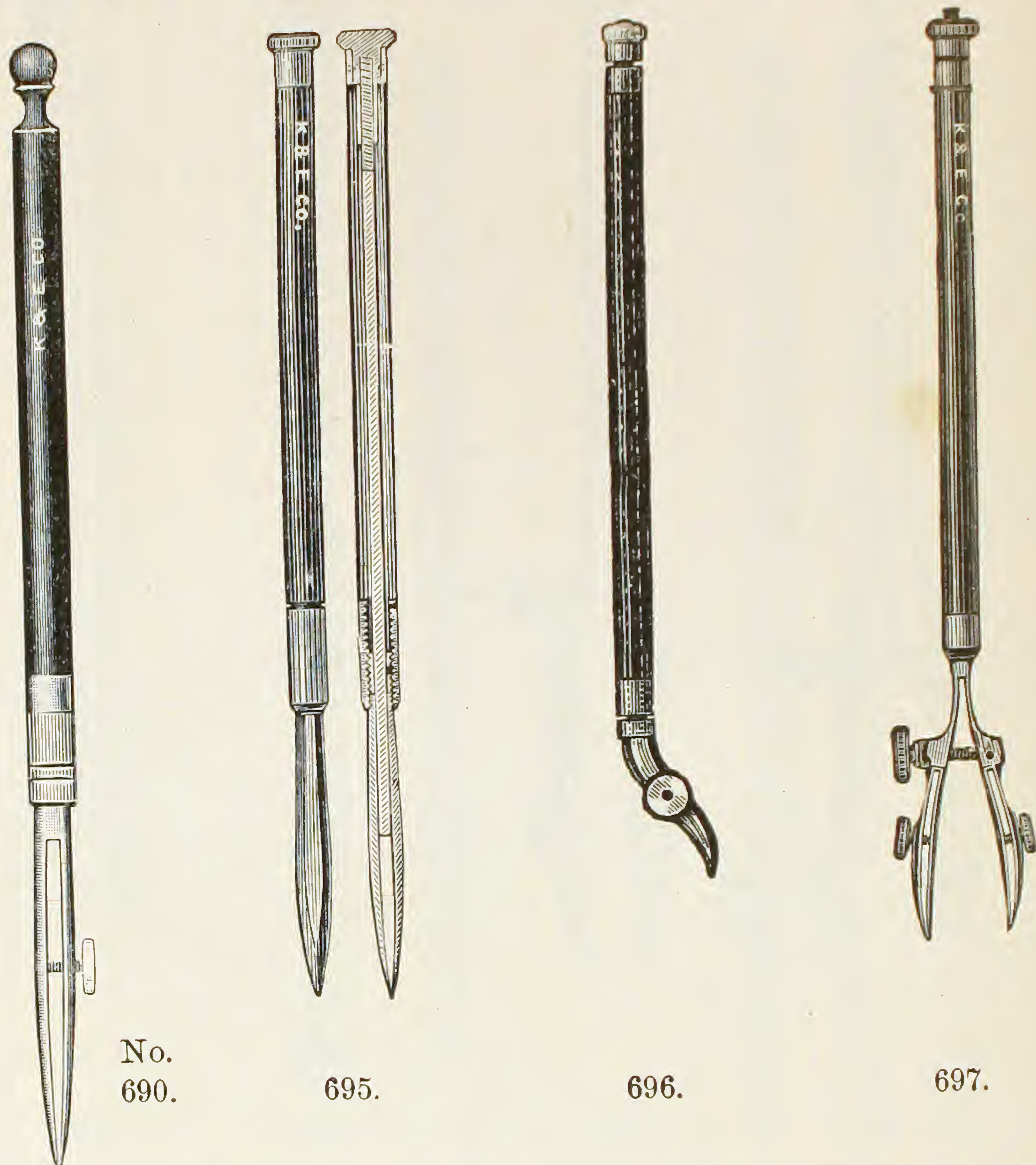


PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

IMPROVED DRAWING PENS.



690. Hatching Pen, extra fine, with Pushing Screw, 6 in. . . each \$
 695. Improved Drawing Pen, 5 $\frac{1}{4}$ in., without thumb screw . . . “

This pen opens and closes by turning the set screw at the upper end of the handle—a decided improvement on the screw through the blades arrangement—preventing displacement of the nibs sideways. As there is no obstruction to the sight in working, this pen is preferable for fine work. (See page 5).

696. Improved Curve Pen, 4 $\frac{3}{4}$ in., spring blade each \$

This pen has a hollow handle in which a thin rod rotates. The blades being fastened to the end of the rod and being eccentric to it, turn easily and follow the smallest curve with precision. By means of a nut at the upper end of the rod, the pen can be clamped and may then be used as a regular drawing pen.

697. Improved Railroad Pen, 5 $\frac{1}{4}$ in., spring blades each \$

The construction of this pen is like that of No. 696 with the exception that it has two pairs of blades.

These improved pens have been extensively imitated in inferior qualities. Insist upon obtaining the Paragon brand.

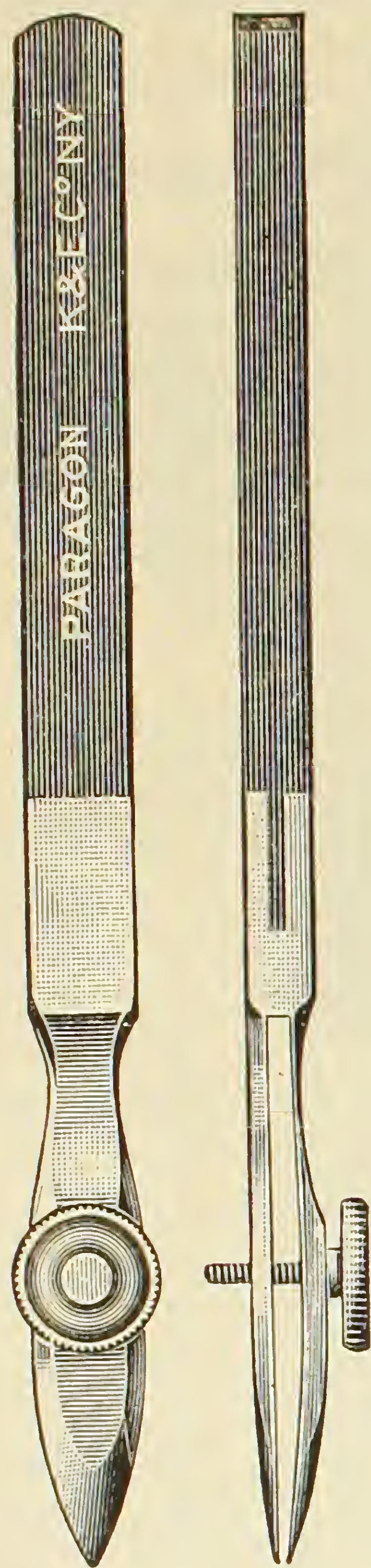
Drawing Pens carefully set and sharpened each \$



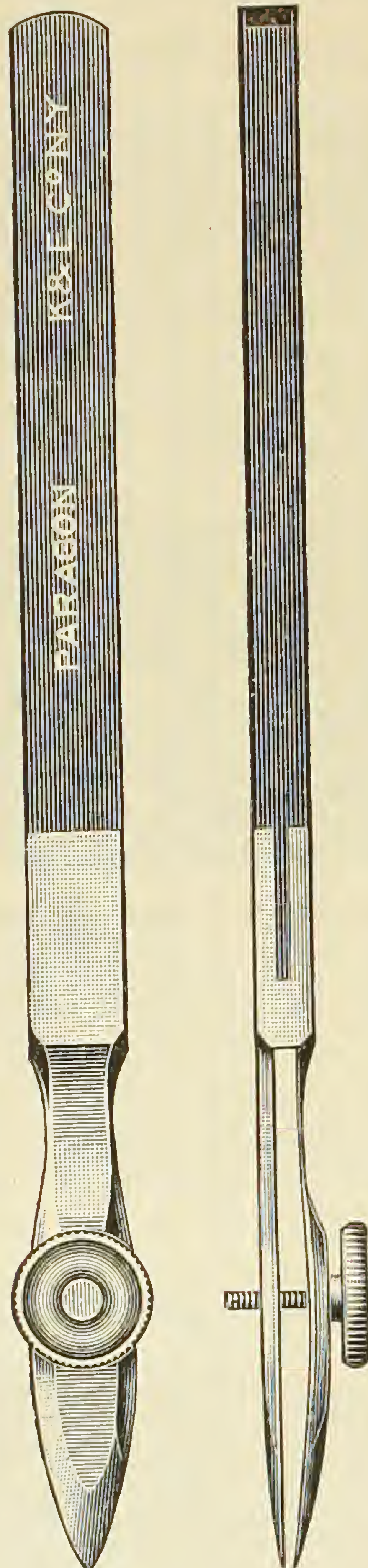
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

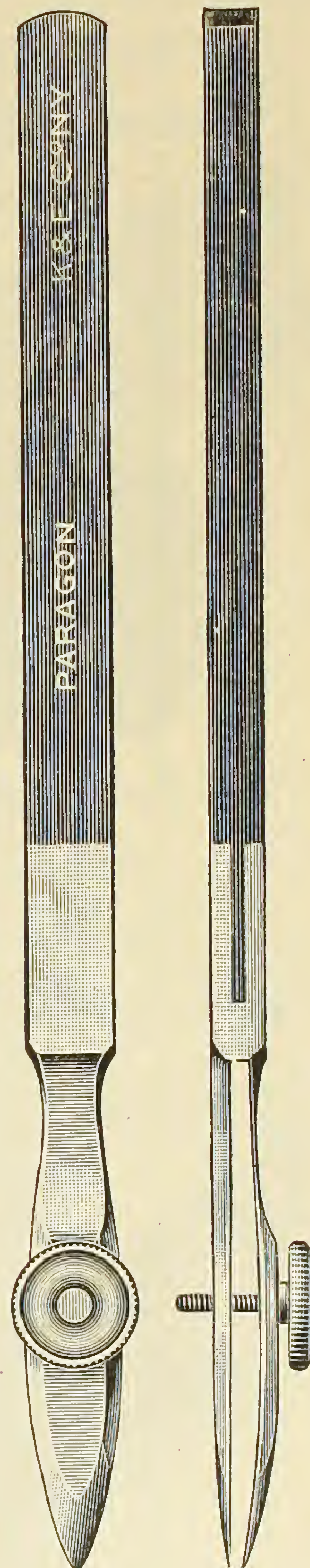
Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



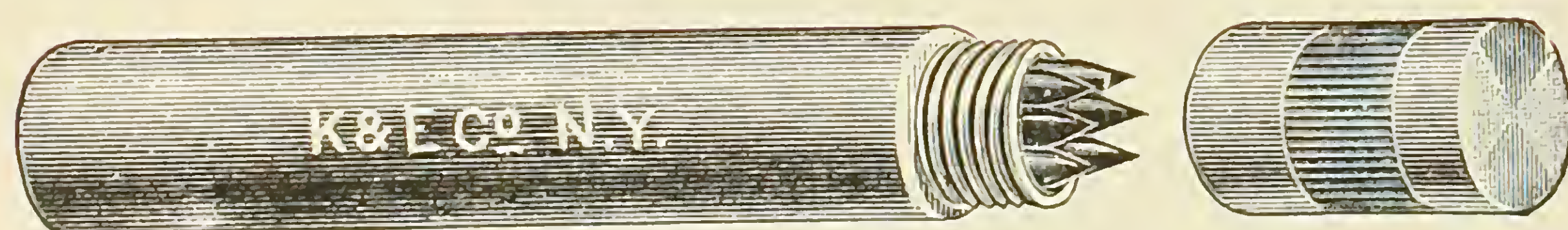
No. 558-1.



558-2.



558-3.



No. 559.

558-1.	Detail Drawing Pen, 5 in., upper blade with spring, flat						
	Ebony Handle					each	\$
558-2.	do. do. 6 in. do.					"	
558-3.	do. do. 7 " do.					"	

Above Pens, with Aluminum Handle, are furnished at the same prices.

559. Fine nickel silver Lead Box, screw cap, containing 6 leads each \$

601 &c. Dividers, Compasses with Esser's Joint, see pages 14 to 17.

Drawing Pens carefully set and sharpened each \$



PARAGON INSTRUMENTS

REG. U. S. PAT. OFF.

WITH

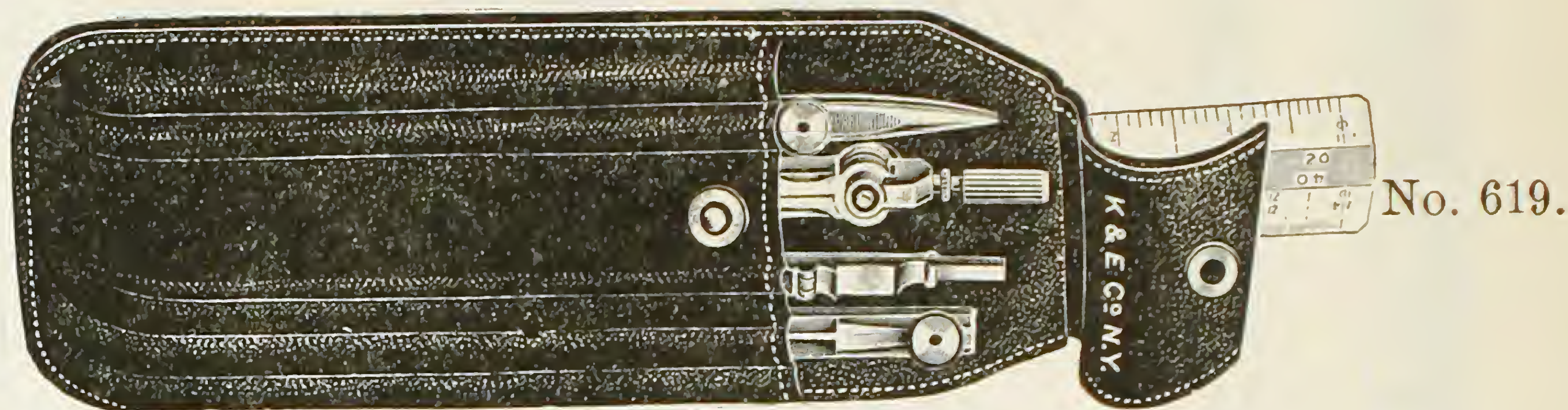
ESSER'S PIVOT JOINT.

IN MOROCCO POCKET CASES, SILK VELVET LINED.

SETS OF ANY OTHER COMBINATION FURNISHED TO SUIT THE PURCHASER.

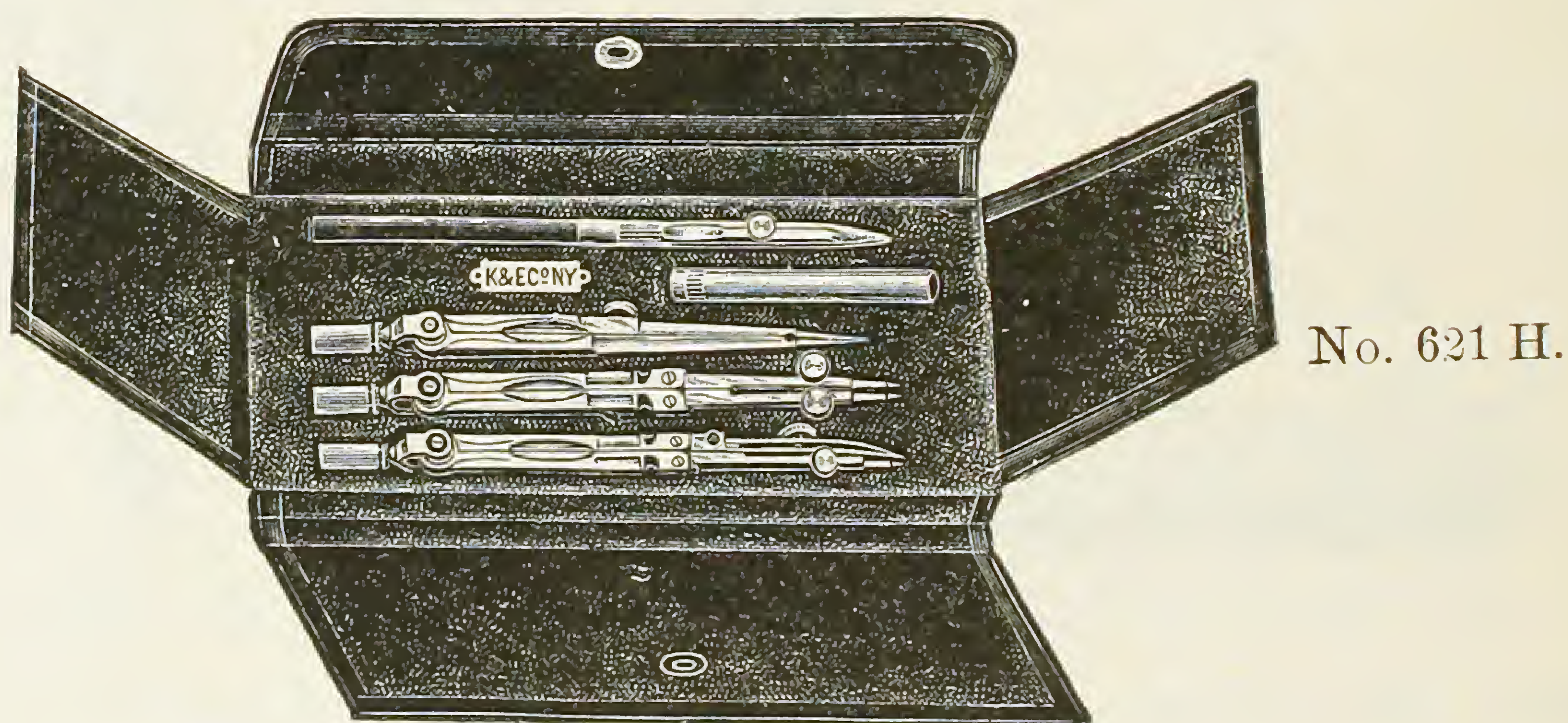
Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

The Compasses in these sets are listed with insertion pieces with pentagonal shank (with thumbscrew). We furnish them, also, with the insertion pieces with round shank and spring socket (without thumbscrew) at the same price, if the compass is listed separately in that form.



- 619.** Vest Pocket Set, **sewed leather Pouch**, about $2\frac{1}{2} \times 7$ in., with flap and button catch, containing:-
- 1 Compasses $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 610,
 - 1 Drawing Pen, Ebony Handle, 5 in., upper blade with spring, No. 523,
 - 1 Paragon Scale 6 in., 10, 30, 40 and 50 parts to the inch, No. 1419 P. each \$

The pouch also contains compartments for a pencil and a fountain pen. These are not covered by the flap, and therefore, are readily accessible.



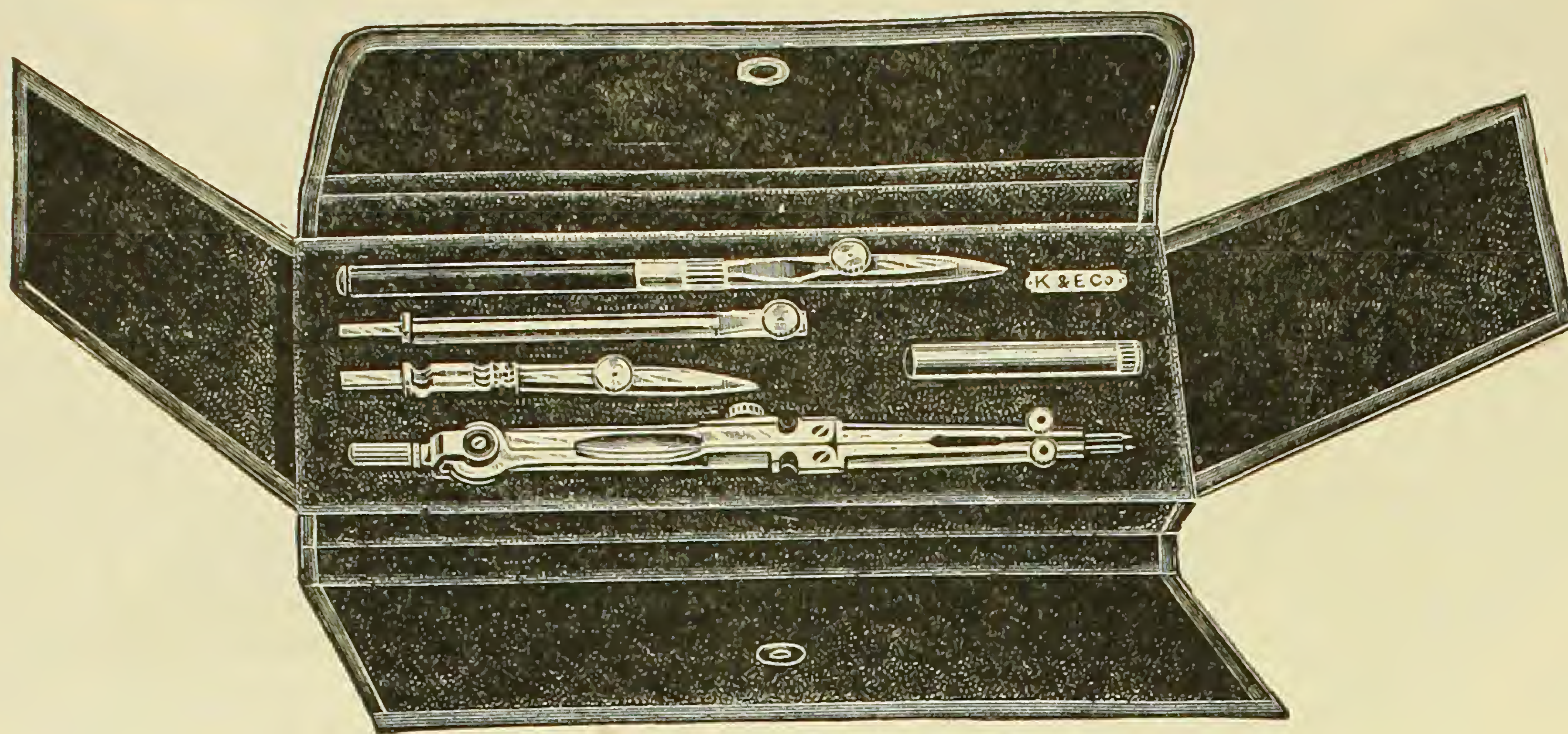
- 621 H.** Pocket Case with **folding flaps** containing:-
- 1 Compasses, $4\frac{1}{4}$ in., with fixed Needle Point with Hairspring and Pen Point, No. 604 H,
 - 1 Compasses, $4\frac{1}{4}$ in., with fixed Needle Point with Hairspring and Pencil Point, No. 605 H,
 - 1 Hairspring Divider, 4 in., No. 601,
 - 1 Drawing Pen, Ebony Handle, $4\frac{1}{2}$ in., upper blade with spring, No. 522,
 - 1 Nickel silver Box with Leads, No. 559 . . . each \$



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

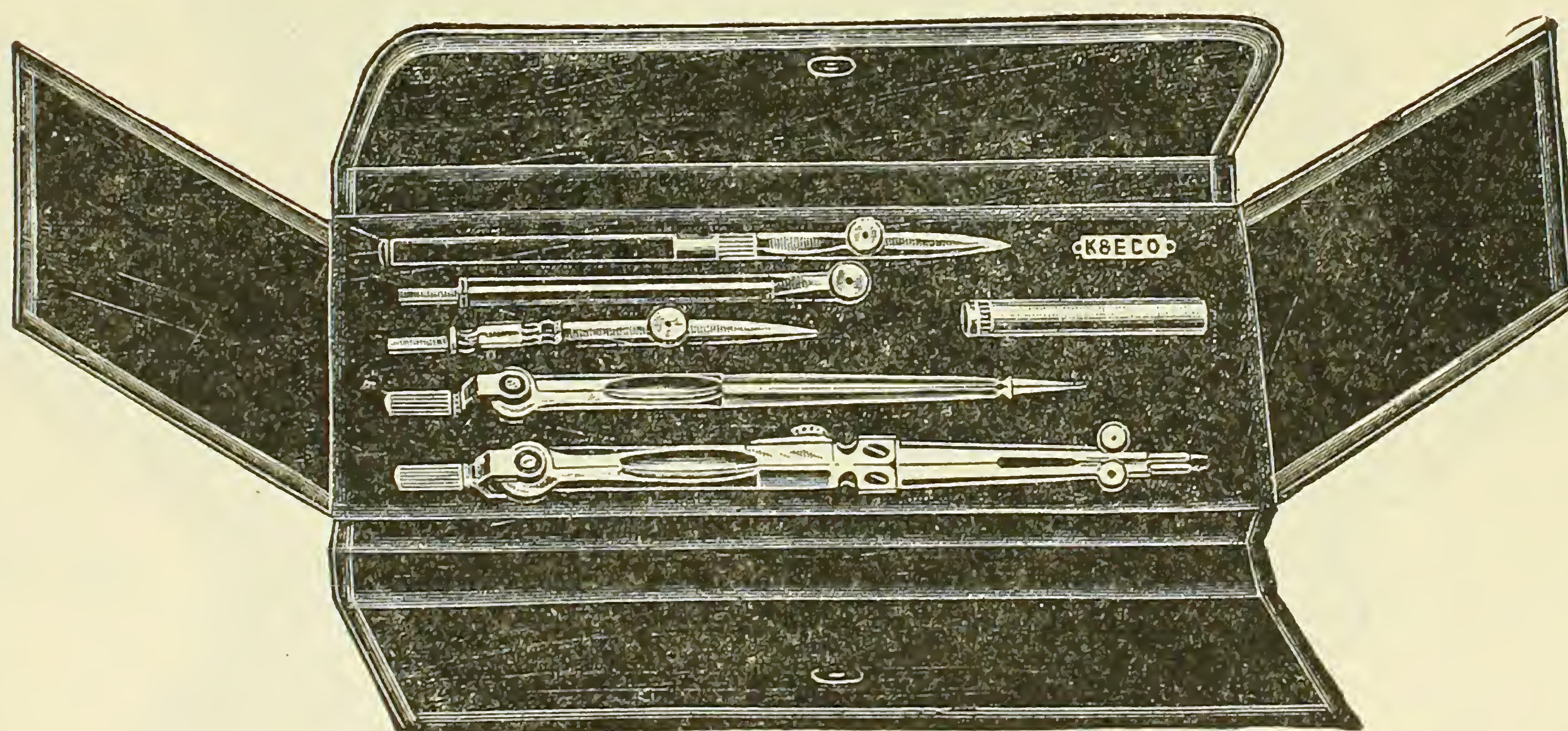
Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 622-1.

622-1. Pocket Case with folding flaps, containing:-

- 1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar No. 610,
- 1 Drawing Pen, Ebony Handle, 5 in., upper blade, with spring, No. 523,
- 1 Nickel silver Box with Leads, No. 559 each \$



No. 622-2.

622-2. Pocket Case with folding flaps, containing same assortment as No. 622-1, but with addition of 1 Plain Divider, $5\frac{3}{4}$ in., No. 606 each \$

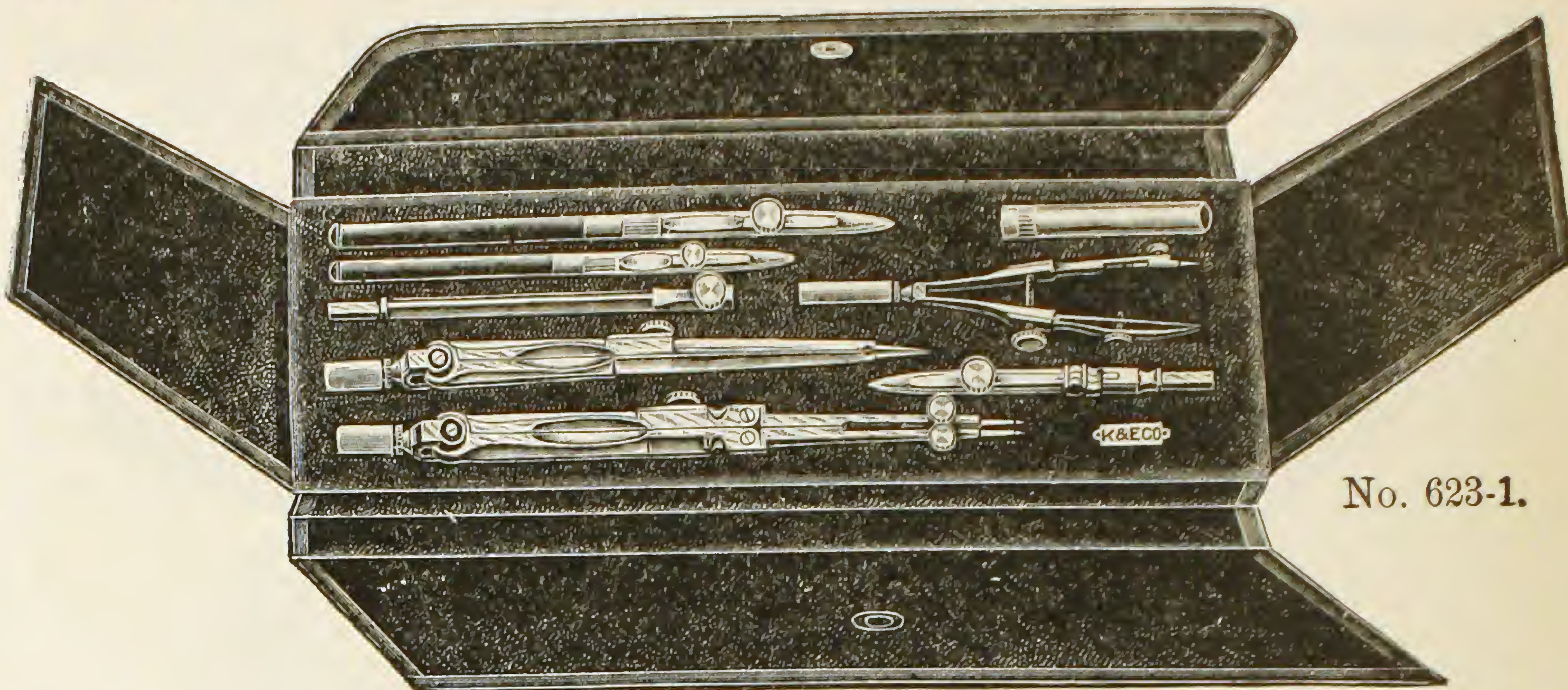
See note at top of page 34; insertion pieces with round shank (no thumbscrew).



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

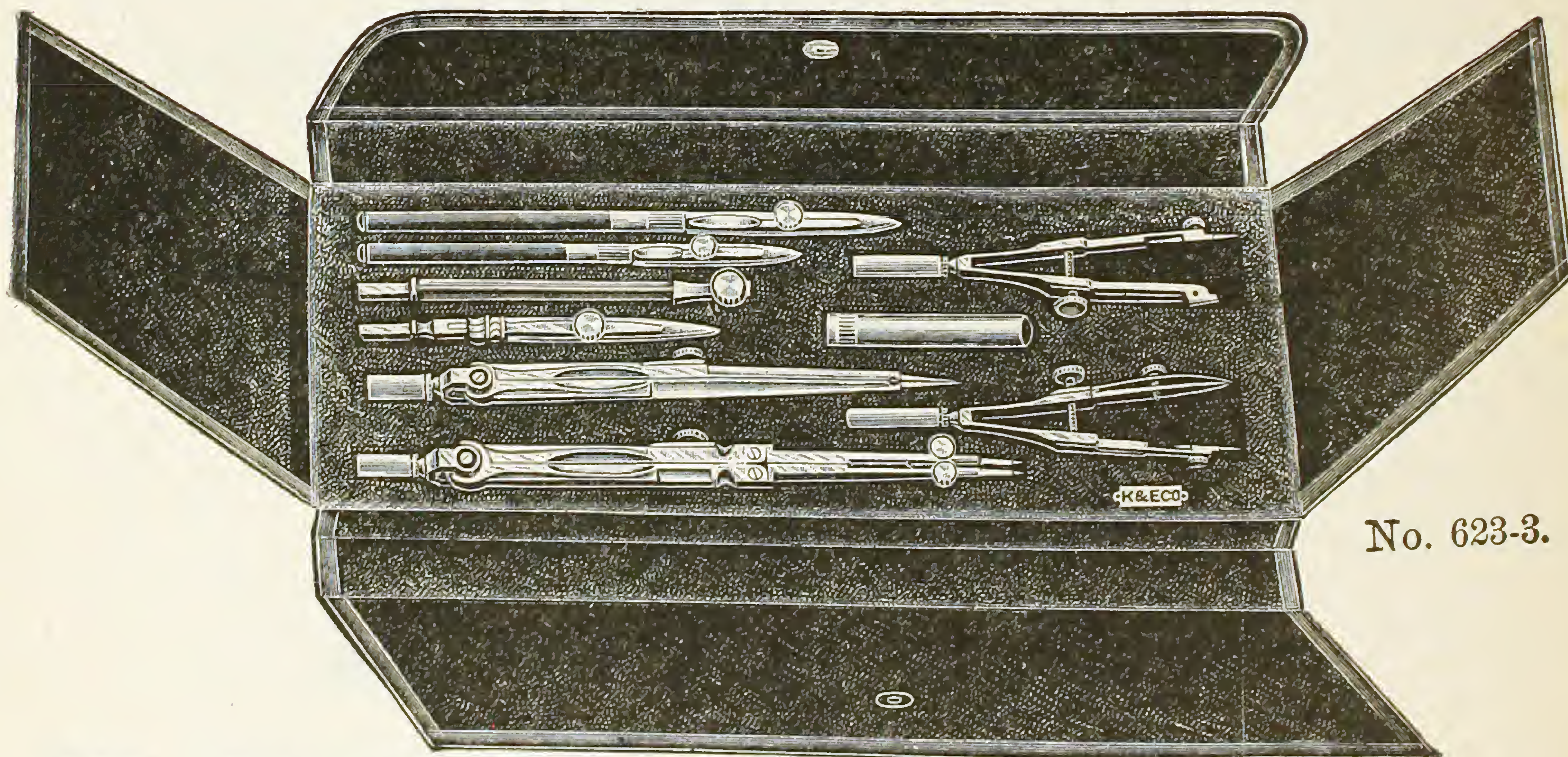


No. 623-1.

623-1. Pocket Case with **folding flaps**, containing:-

- 1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 610,
- 1 Hairspring Divider, $5\frac{3}{4}$ in., No. 608,
- 1 Steelspring Bow Pen, No. 481,
- 1 each Drawing Pen, Ebony Handle $4\frac{1}{2}$ in., $5\frac{1}{2}$ in. upper blade with spring, Nos. 522, 523 $\frac{1}{2}$,
- 1 Nickel silver Box with Leads, No. 559 each \$

623-1C. Pocket Case with **folding flaps**, containing same assortment as No. 623-1, but with Bow Pen No. 486 (with central thumbnut) in place of No. 481. “



No. 623-3.

623-3. Pocket Case with **folding flaps**, containing same assortment as No. 623-1 but with addition of 1 Steelspring Bow Pencil, No. 482 each \$

623-3C. Pocket Case with **folding flaps**, containing same assortment as No. 623-3, but bows Nos. 486, 487 (with central thumbnut) in place of Nos. 481, 482 . . . “

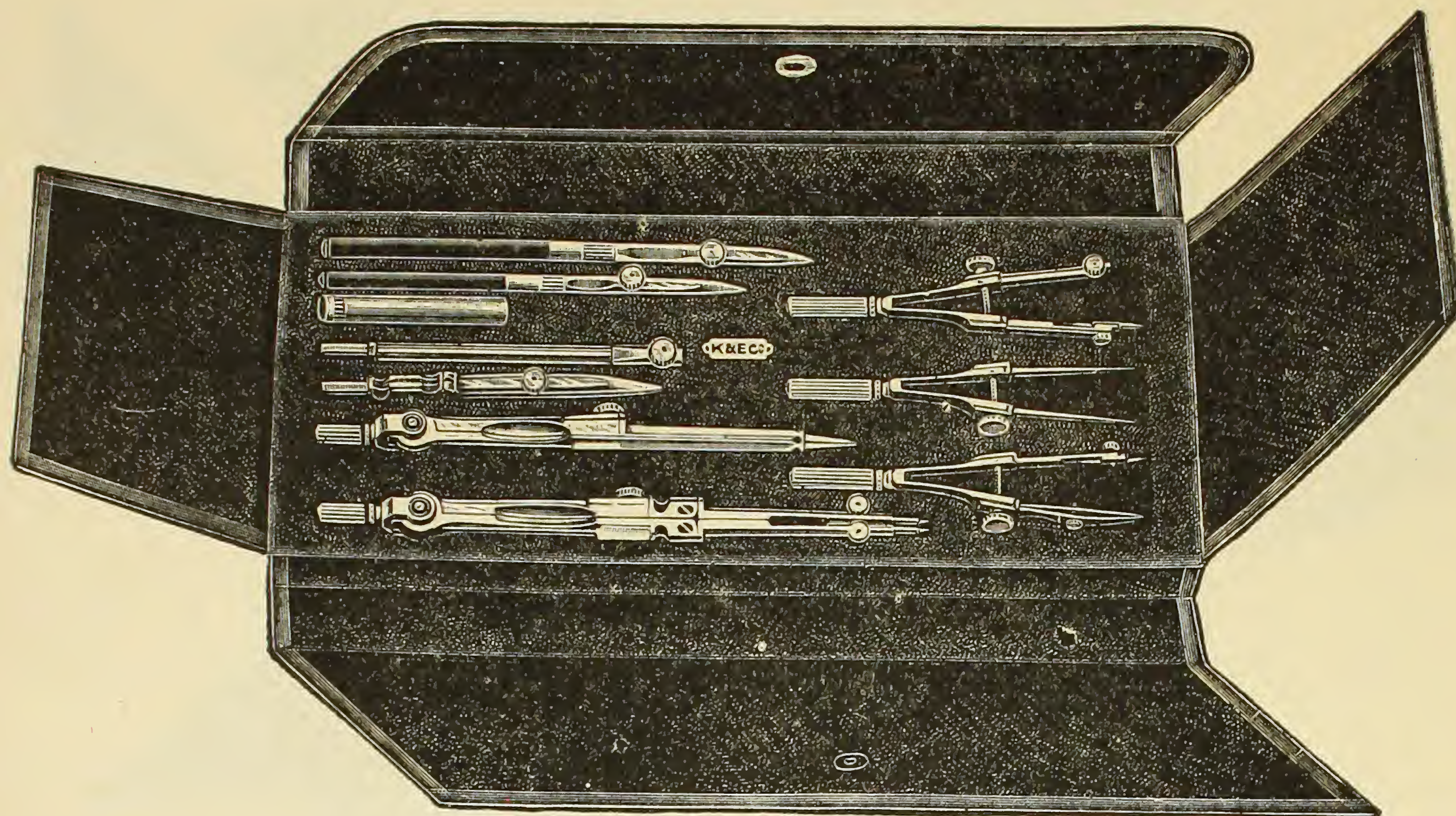
See note at top of page 34; insertion pieces with round shank (no thumbscrew)



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



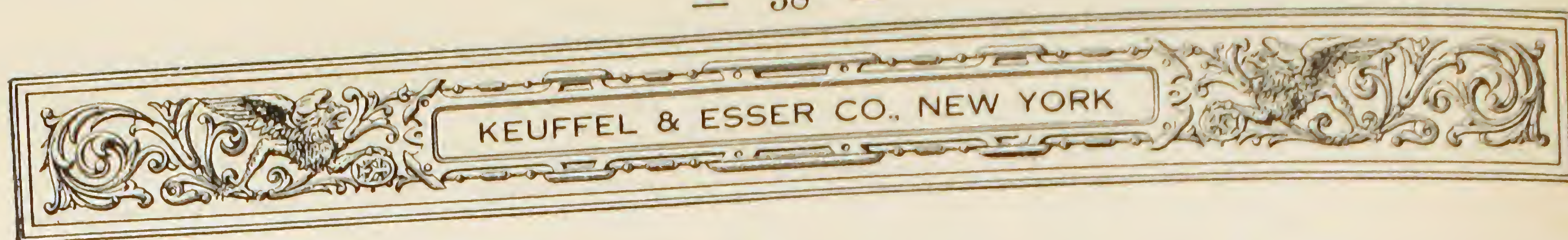
No. 624.

624. Pocket Case with **folding flaps**, containing:-

- 1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 610
- 1 Hairspring Divider, $5\frac{3}{4}$ in., No. 608,
- 1 Steelspring Bow Divider, $3\frac{3}{4}$ in. No. 480,
- 1 do. Bow Pen, $3\frac{3}{4}$ " 481,
- 1 do. Bow Pencil, $3\frac{3}{4}$ " 482,
- 1 Drawing Pen, Ebony Handle, $4\frac{1}{2}$ in., upper blade with spring, No. 522,
- 1 Drawing Pen, Ebony Handle, $5\frac{1}{2}$ in., upper blade with spring, No. 523 $\frac{1}{2}$,
- 1 Nickel silver Box with Leads, No. 559 each \$

624C. Pocket Case with **folding flaps**, containing same assortment as No. 624, but with Spring Bows Nos. 485, 486, 487, (central thumbnut) in place of Nos. 480, 481, 482 "

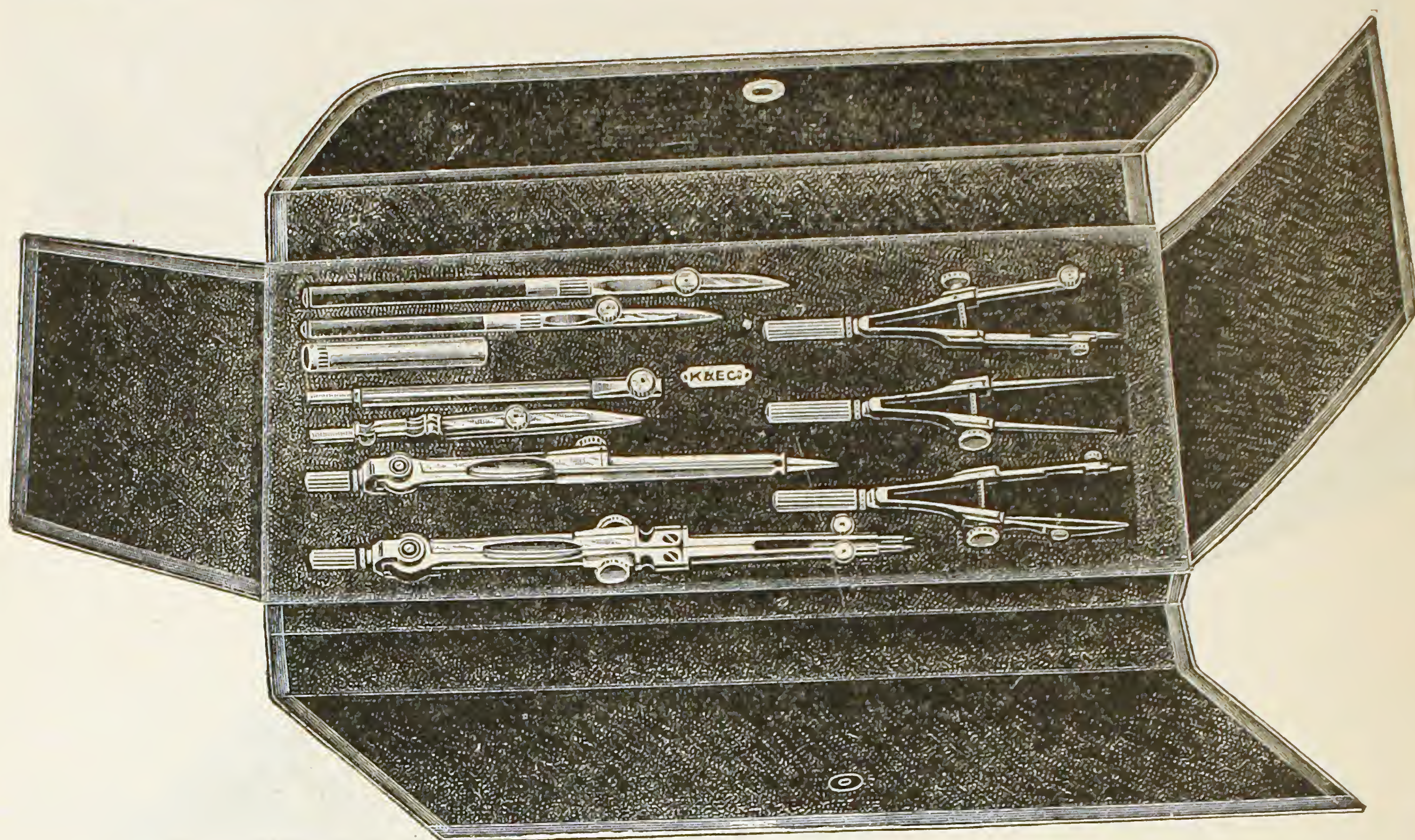
See note at top of page 34; insertion pieces with round shank (no thumbscrew).



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 624 H.

624 H. Pocket Case with **folding flaps**, containing:-

- 1 Compasses, $6\frac{1}{4}$ in., fixed Needle Point with Hair-spring, Pen, Pencil Point and Lengthening Bar, No. 610 H,
- 1 Hairspring Divider, $5\frac{3}{4}$ in., No. 608,
- 1 Steelspring Bow Divider, $3\frac{3}{4}$ in., No. 480,
- 1 do. Bow Pen, $3\frac{3}{4}$ " 481,
- 1 do. Bow Pencil, $3\frac{3}{4}$ " 482,
- 1 Drawing Pen, Ebony Handle, $4\frac{1}{2}$ in., upper blade with spring, No. 522,
- 1 Drawing Pen, Ebony Handle, $5\frac{1}{2}$ in., upper blade with spring, No. 523 $\frac{1}{2}$,
- 1 Nickel silver Box with Leads, No. 559 each \$

624 HC. Pocket Case with **folding flaps**, containing same assortment as No. 624 H, but with Spring Bows Nos. 485, 486, 487 (central thumbnut) in place of Nos. 480, 481, 482 "

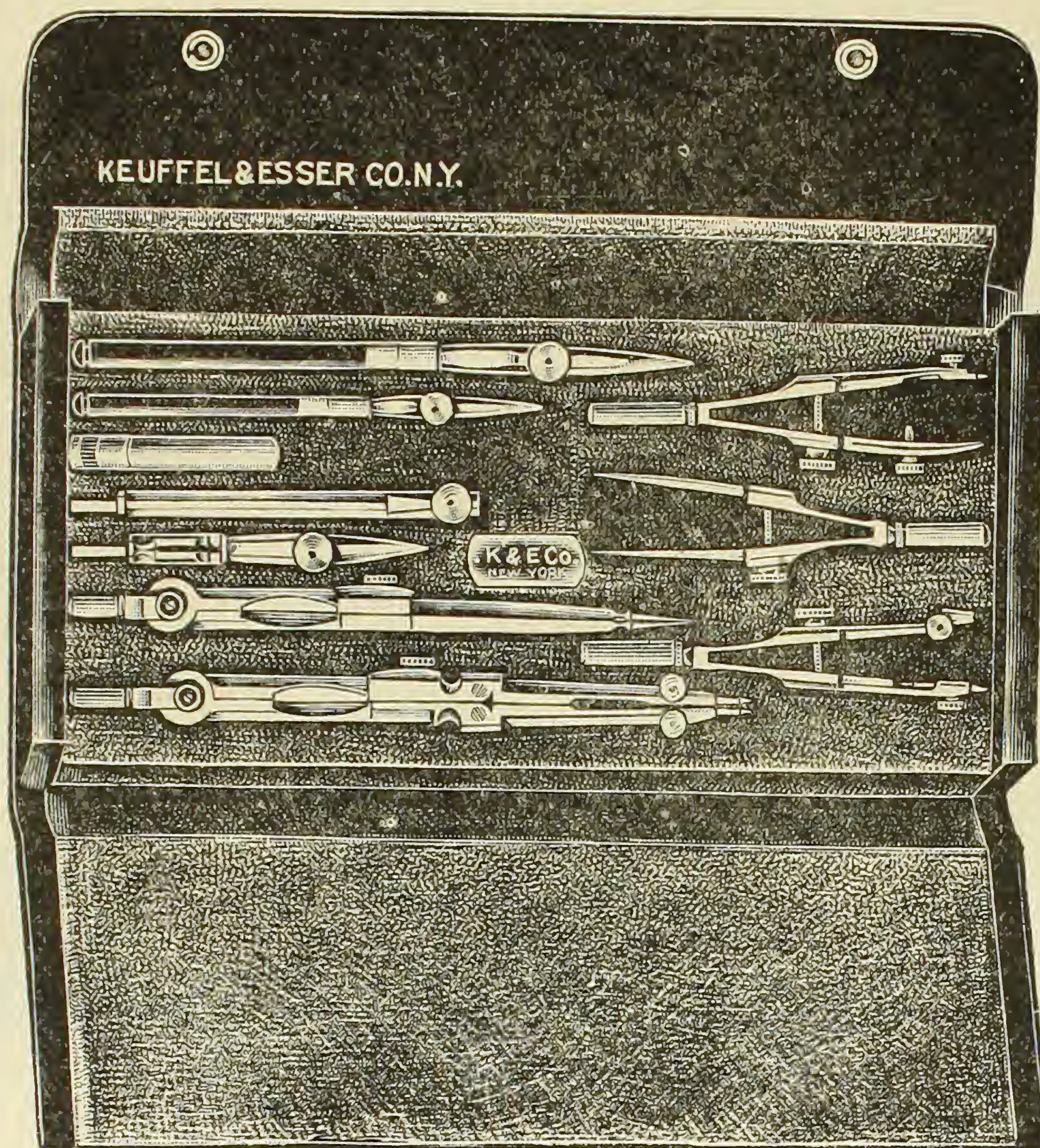
See note at top of page 34; insertion pieces with round shank (no thumbscrew).



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



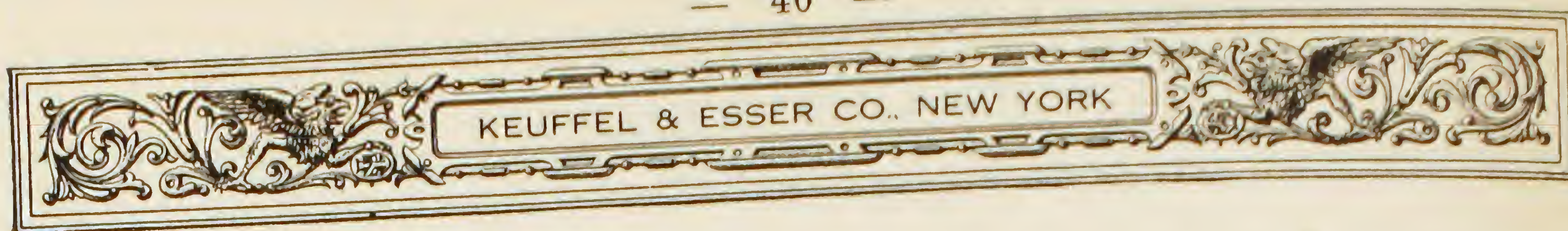
No. 624 A.

624 A. Improved Pocket Case, with **folding covers and pocket**, containing:-

- 1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 610,
- 1 Hairspring Divider, $5\frac{3}{4}$ in., No. 608,
- 1 Steelspring Bow Divider, $3\frac{3}{4}$ in., No. 480,
- 1 do. Bow Pen, $3\frac{3}{4}$ " 481,
- 1 do. Bow Pencil, $3\frac{3}{4}$ " 482,
- 1 Drawing Pen, Ebony Handle $4\frac{1}{2}$ in., upper blade with spring, No. 522,
- 1 Drawing Pen, Ebony Handle, $5\frac{1}{2}$ in., upper blade with spring, No. 523 $\frac{1}{2}$,
- 1 Nickel silver Box with Leads, No. 559 each \$

624 AC. Improved Pocket Case, with **folding covers and pocket**, containing same assortment as No. 624 A, but with Spring Bows Nos. 485, 486, 487 (with central thumbnut) in place of Nos. 480, 481, 482 "

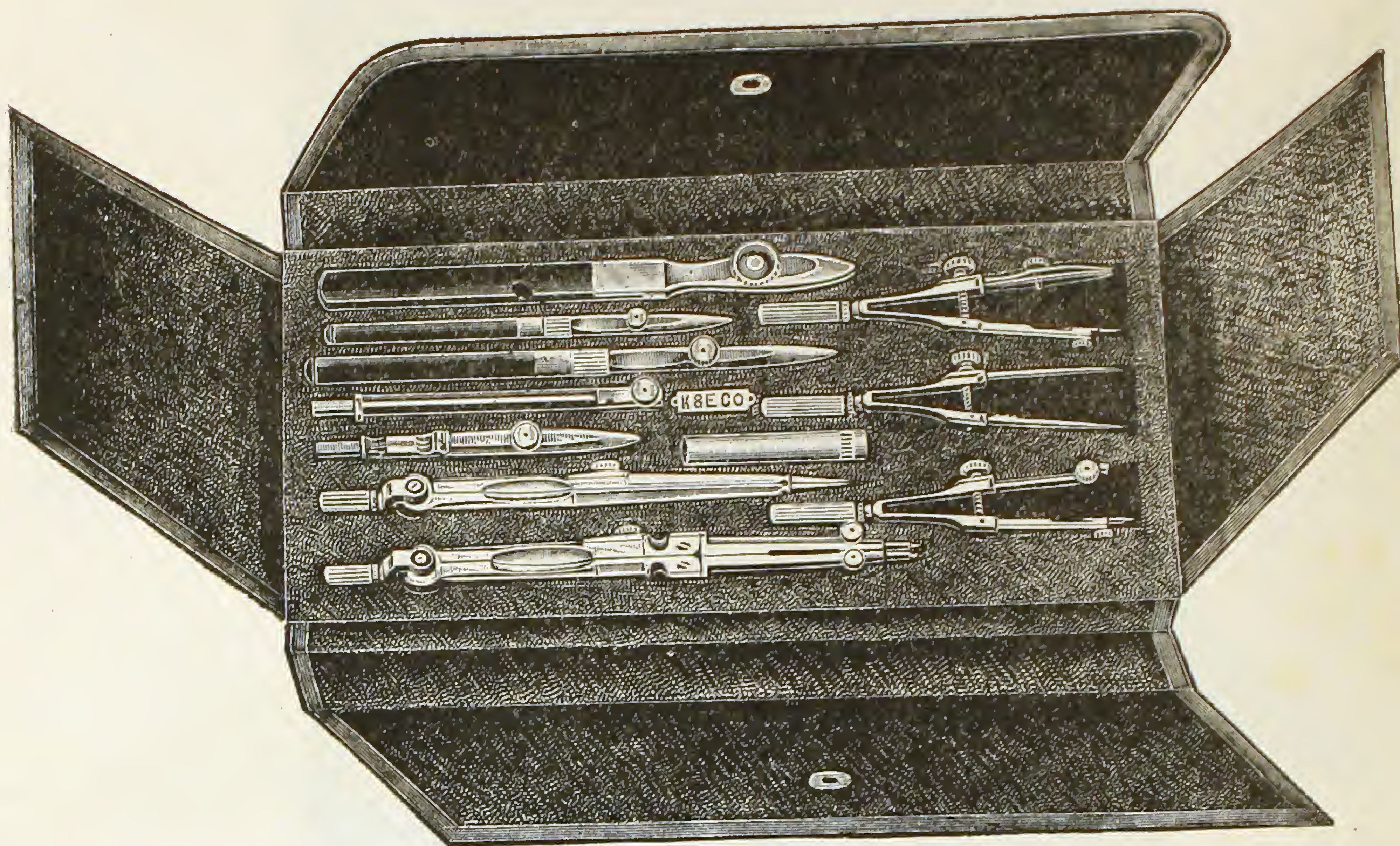
See note at top of page 34; insertion pieces with round shank (no thumbscrew).



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 624½.

624½. Pocket Case with folding flaps, containing:-

- 1 Compasses, 6¼ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 610,
- 1 Hairspring Divider, 5¾ in., No. 608,
- 1 Steelspring Bow Divider, 3¾ in. No. 480,
- 1 do. Bow Pen, 3¾ " 481,
- 1 do. Bow Pencil, 3¾ " 482,
- 1 Drawing Pen, Ebony Handle, 4½ in., upper blade with spring, No. 522,
- 1 Drawing Pen, Ebony Handle, 5½ in., upper blade with spring, No. 523½,
- 1 Detail Drawing Pen, flat Ebony Handle 6 in., upper blade with spring, No. 558-2,
- 1 Nickel silver Box with Leads, No. 559 each \$

624½C. Pocket Case with folding flaps, containing same assortment as No. 624½, but with Spring Bows Nos. 485, 486, 487. (central thumbnut) in place of Nos. 480, 481, 482 "

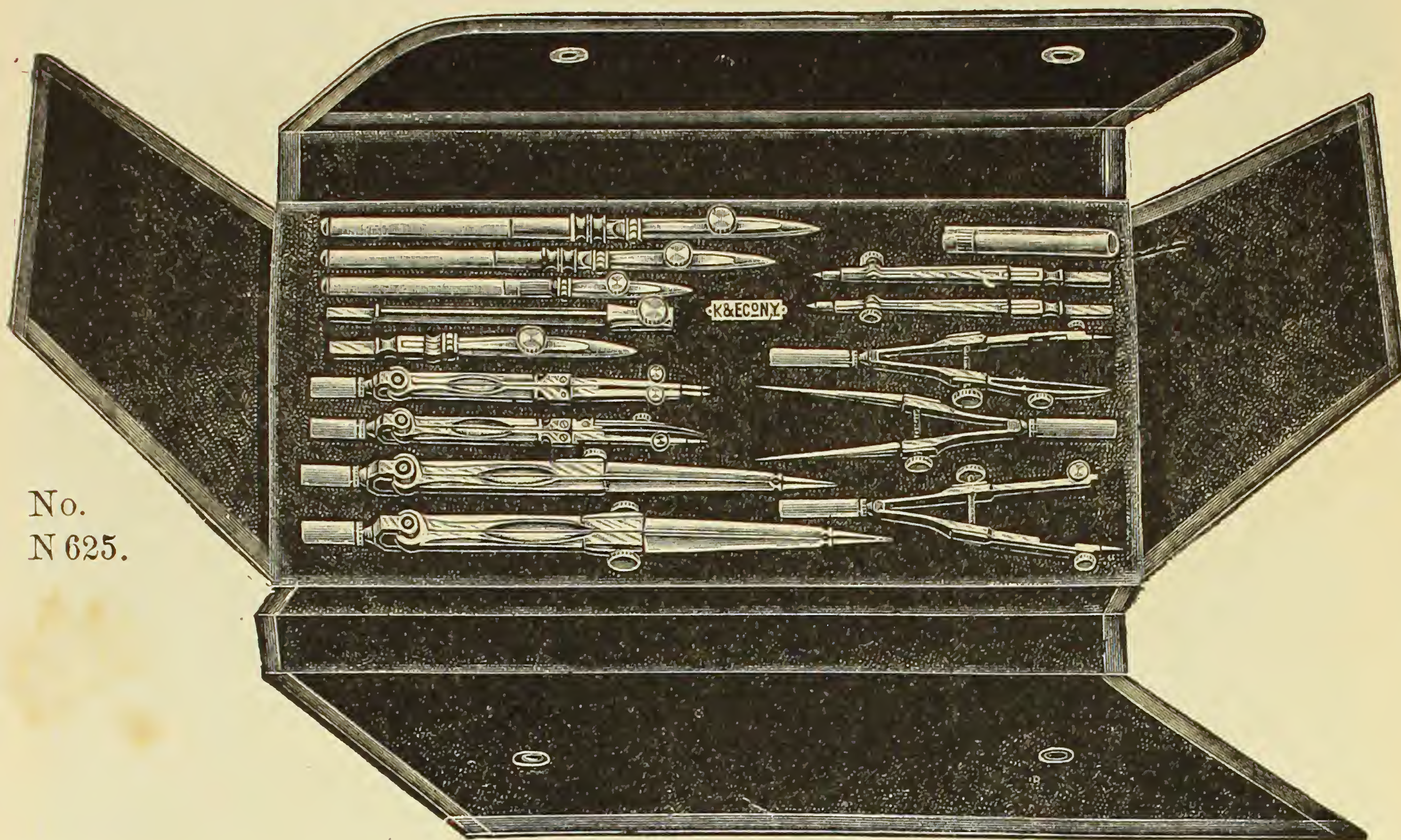
See note at top of page 34; insertion pieces with round shank (no thumbscrew)



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No.
N 625.

N625. Pocket Case, with folding flaps, containing:-

- 1 Compasses, $6\frac{1}{4}$ in., with 2 Steel Points, Pen, Pencil, Needle Point and Lengthening Bar, No. 612,
- 1 Compasses $4\frac{1}{4}$ in., fixed Needle and Pen Point, No. 604 H,
- 1 do. $4\frac{1}{4}$ " " " " Pencil " " 605 H,
- 1 Hairspring Divider, $5\frac{3}{4}$ in., No. 608,
- 1 Steelspring Bow Divider, $3\frac{3}{4}$ in., No. 480,
- 1 do. Bow Pen, $3\frac{3}{4}$ " 481,
- 1 do. Bow Pencil, $3\frac{3}{4}$ " 482,
- 1 Drawing Pen with Joint, Ivory Handle, 4 in., No. 526,
- 1 Drawing Pen with Joint and Pin, Ivory Handle, 5 in., No. 527,
- 1 Drawing Pen with Joint and Pin, Ivory Handle, $5\frac{1}{2}$ in., No. 528,
- 1 Nickel silver Box with Leads, No. 559 each \$

N 625 C. Pocket Case with folding flaps containing same assortment as No. N 625 but with Spring Bows, Nos. 485, 486, 487, (central thumbnut) in place of Nos. 480, 481, 482 "

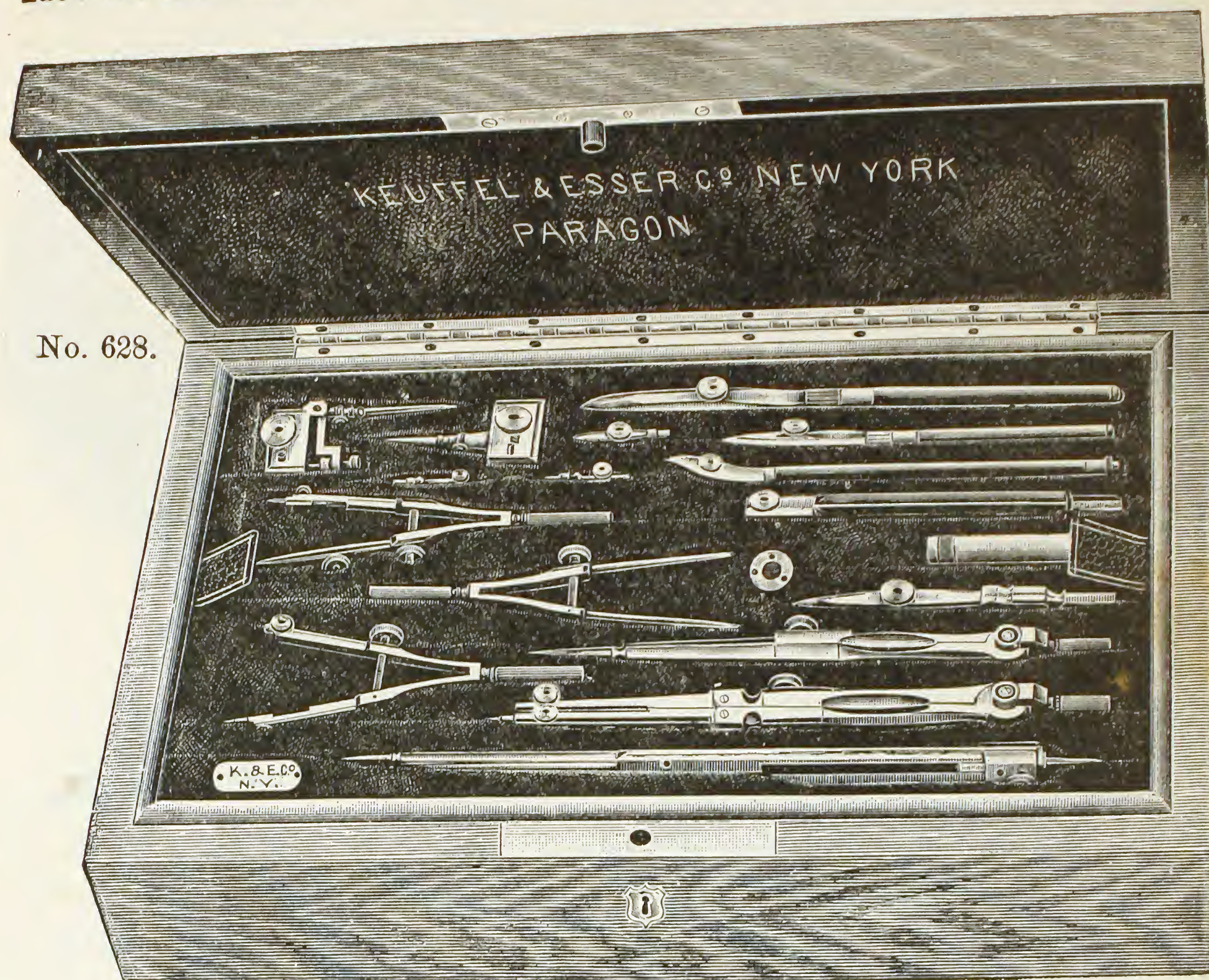
See note at top of page 34; insertion pieces with round shank (no thumbscrew).



PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.



No. 628.

628. Polished Mahogany Case, Tray lined with Silk Velvet, with Lock, containing:-

- 1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 610,
 - 1 Hairspring Divider, $5\frac{3}{4}$ in., No. 608,
 - 1 Proportional Divider, No. 435,
 - 1 Minute Beam Compass, with 2 Steel Points, Pen, Pencil and Needle Point, No. 509,
 - 1 Steelspring Divider, $3\frac{3}{4}$ in., No. 480,
 - 1 do. Bow Pen, $3\frac{3}{4}$ " 481,
 - 1 do. Bow Pencil, $3\frac{3}{4}$ " 482,
 - 1 Drawing Pen, Ebony Handle, $4\frac{1}{2}$ in., upper blade with spring, No. 522,
 - 1 Drawing Pen, Ebony Handle, $5\frac{1}{2}$ in., upper blade with spring, No. 523 $\frac{1}{2}$,
 - 1 Improved Curve Pen, $4\frac{3}{4}$ in., No. 696,
 - 1 Horn Center with nickel silver Rim, No. 2691,
 - 1 Nickel silver Box with Leads, No. 559 each \$
- Size of tray 6×10 in.; space under tray $\frac{3}{4}$ in. high.

628 C. Above set with spring bows, Nos. 485, 486, 487, (central thumbnut) in place of Nos. 480, 481, 482, "

See note at top of page 34; insertion pieces with round shank (no thumbscrew).

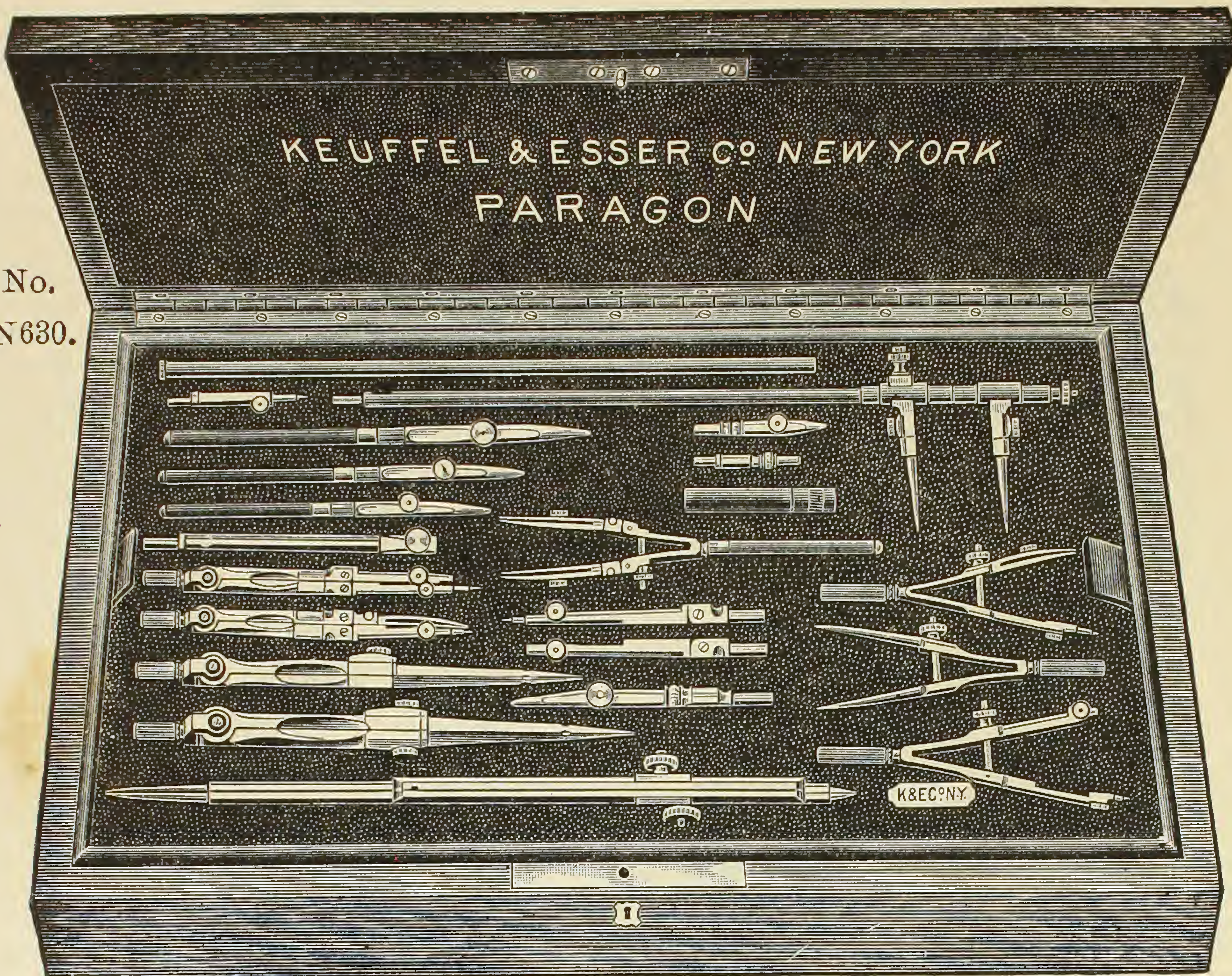


PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

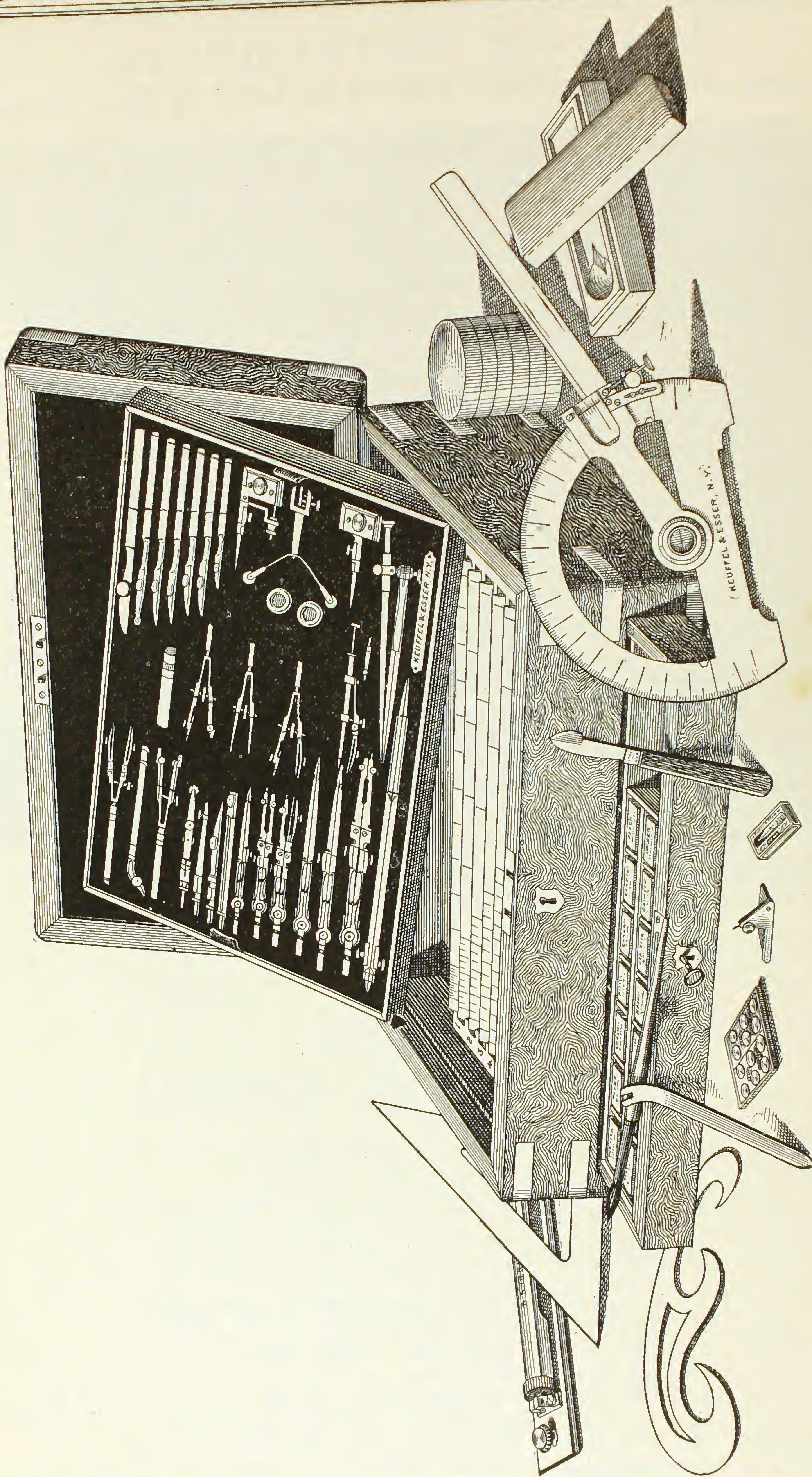
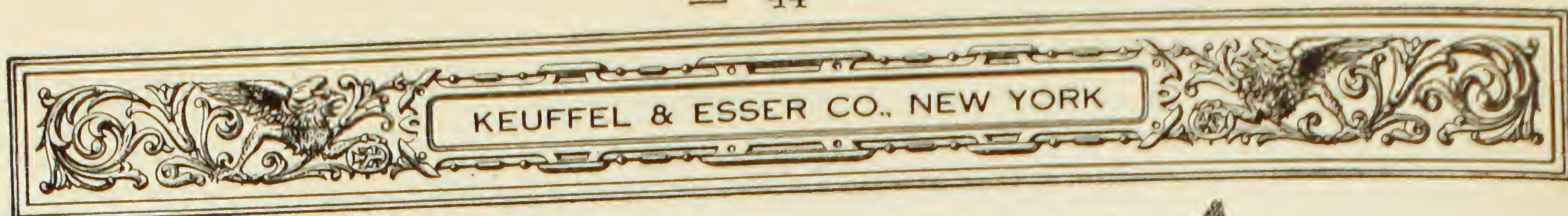
No.
N630.



N630. Polished Mahogany Case, Tray lined with Silk Velvet, with Lock, cont'g:

- 1 Compasses, $6\frac{1}{4}$ in., with 2 Steel Points, Pen, Pencil, Needle Point and Lengthening Bar, No. 612,
 - 1 Compasses, $4\frac{1}{4}$ in., fixed Needle and Pen Point, No. 604H,
 - 1 Compasses, $4\frac{1}{4}$ in., fixed Needle and Pencil Point, No. 605H,
 - 1 Hairspring Divider, $5\frac{3}{4}$ in., No. 608,
 - 1 Proportional Divider, No. 437,
 - 1 Tubular Beam Compass, 27 in., 3 round nickel silver Bars, 2 Steel Points, Pen, Pencil and Needle Point, No. 501.
 - 1 Steelspring Divider; $3\frac{3}{4}$ in., No. 480,
 - 1 " Bow Pen, $3\frac{3}{4}$ " 481,
 - 1 " Bow Pencil, $3\frac{3}{4}$ " 482,
 - 1 Drawing Pen, Ebony Handle, $4\frac{1}{2}$ in., upper blade with spring, No. 522,
 - 1 Drawing Pen, Ebony Handle, 5 in., upper blade with spring, No. 523,
 - 1 Drawing Pen, Ebony Handle, $5\frac{1}{2}$ in., upper blade with spring No. 523 $\frac{1}{2}$,
 - 1 Railroad Pen, improved, Ivory Handle, 5 in., No. 545,
 - 1 Nickel silver Box with Leads, No. 559. each \$
- Size of tray 7×13 in.; space under tray $\frac{3}{4}$ in., high.
- N630C** Above set with spring bows, Nos. 485, 486, 487 (central thumbnut) in place of Nos. 480, 481, 482, "

See note at top of page 34; insertion pieces with round shank (no thumbscrew).
For empty cases for instruments, see pages 96 and 97.



No. N 633.



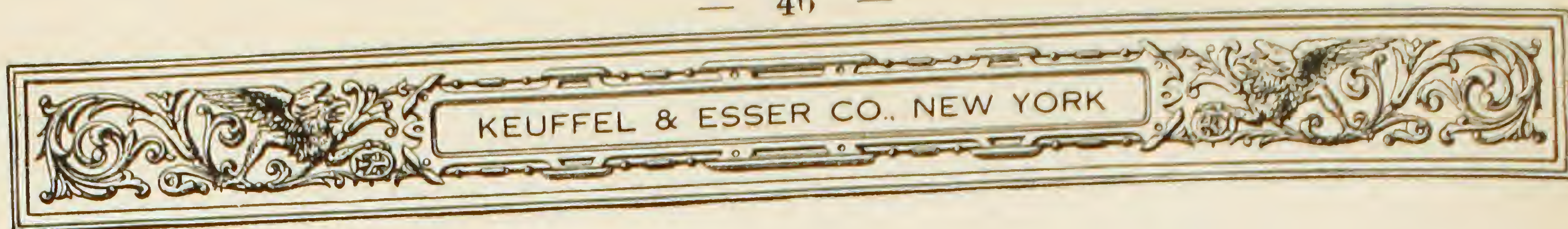
PARAGON INSTRUMENTS.

REG. U. S. PAT. OFF.

Each instrument stamped KEUFFEL & ESSER CO., or K. & E. CO., N. Y. Paragon.

N633. Fine polished Mahogany Case, with Tray lined with Silk Velvet, Drawer, nickel silver Bands and Corners, with Lock, (see illustration) containing:

- 1 Compasses 6 $\frac{1}{4}$ in., with fixed Needle Point, with Hairspring, Pen, Pencil Point, Lengthening Bar, Dotting Pen, No. 610 HD,
- 1 Compasses, 4 $\frac{1}{4}$ in., with fixed Needle and Pen Point and with Hairspring, 604 H,
- 1 Compasses, 4 $\frac{1}{4}$ in., with fixed Needle and Pencil Point and with Hairspring 605 H,
- 1 Hairspring Divider, 4 in., No. 601,
- 1 Plain Divider, 5 $\frac{3}{4}$ in., No. 606,
- 1 Hairspring Divider, 5 $\frac{3}{4}$ in., No. 608,
- 1 Three legged Divider, No. 431,
- 1 Proportional Divider Universal, with movable Points, No. 440,
- 1 Drop Spring Bow Pen and Pencil, No. 454,
- 1 Set Steelspring Dividers and Bows, No. 485, 486K, 487,
- 1 Beam Compass 510, with Wheel Attachment 511,
- 1 Drawing Pen, 4 $\frac{1}{2}$ in., No. 522 K,
- 2 do. 5 " " 523 K,
- 2 do. 5 $\frac{1}{2}$ " " 524 K,
- 1 Detail Drawing Pen, 6 in., No. 558-2,
- 1 Railroad Pencil, 5 in., No. 543.
- 1 Improved Curve Pen, 4 $\frac{3}{4}$ in., No. 696.
- 1 Railroad Pen, 5 in., Ivory Handle, No. 697,
- 1 Dotting Pen, 6 " " " 551,
- 2 Horn Centers with nickel silver rim, No. 2691,
- 1 Nickel Silver Box with Leads, No. 559,
- 1 Set (8) Paragon Scales No. 1576 P,
- 1 Paper Cutter, No. 2701,
- 1 Protractor, No. 1228,
- 1 Nickel Silver Parallel Rule, No. 1751,
- 2 doz. each Nickel Silver Thumb Tacks, Nos. 2643, 2644,
- 1 Tacklifter, No. 2680,
- 1 each Xylonite Triangle, No. 1855, 6, 8, 12 in.,
- 1 " " " " 1856, 4, 7, 10 "
- 1 " " Curve, " 1860, 4, 13, 19 "
- 1 Set of 18 Full Pans W. & N. Colors, Nos. 2920-2923,
- 1 Cake Chinese Ink, No. 3031 V,
- 1 doz. assorted Camel Hair Brushes, No. 3102,
- 1 each black Sable Brush, No. 3120, 0 N, 1 N, 3 N, 5 N, 7 N, 9 N,
- 1 " Camel Hair Brush, No. 3136, 1, 2, 3,
- 1 Patent Ink Slab, No. 3150,
- 1 Nest of Saucers, No. 3161,
- 1 doz. Lettering Pens, No. 3202, with Holder,
- 3 Artist Pencils, No. 3383,
- 3 Boxes Leads, No. 3385,
- 1 Cake Pliable Rubber, No. 3452-8,
- 2 Cakes Alba Rubber, No. 3455 G-24,
- 2 " Ink Eraser, No. 3418, 3419,
- 1 Steel Eraser, No. 3481,
- 1 Pencil Pointer, No. 3507, set \$



PARAGON INSTRUMENTS

REG. U. S. PAT. OFF.

SEPARATE PARTS

To accommodate our customers we keep in stock separate parts for our Drawing Instruments, as listed below. While we can replace parts for compasses, we can replace neither the compasses (to be fitted to parts), nor the three-cornered steel legs of compasses. To repair points which are not detachable from the compasses (fixed points) is generally not advisable.

As all inserts to compasses are carefully fitted by hand, they are not interchangeable, but must be fitted to the instrument. The charge for such fitting is included in the following prices.

PARTS FOR PARAGON INSTRUMENTS.

Pen Points, Pencil Points, Needle Points, for Compasses . . .	each	\$
do. do. do. " Beam Compasses	"	
Lengthening Bars for Compasses	"	
Ebony Handles for Drawing Pens	"	
Ivory do. " do.	"	
Aluminum do. " do.	"	
Ivory do. " Bow Instruments	"	
Nickel silver do. " do.	"	
Bow Adjusting Screws	"	
Bow Adjusting Nuts	"	
Thumbscrew with right and left Thread for Nos. 485 to 487 . .	"	
Pen Adjusting Screws	"	
Pencil Clamp Screws	"	
Needle Clamp Screws	"	
Shouldered Needles	"	



KEY DRAWING INSTRUMENTS.

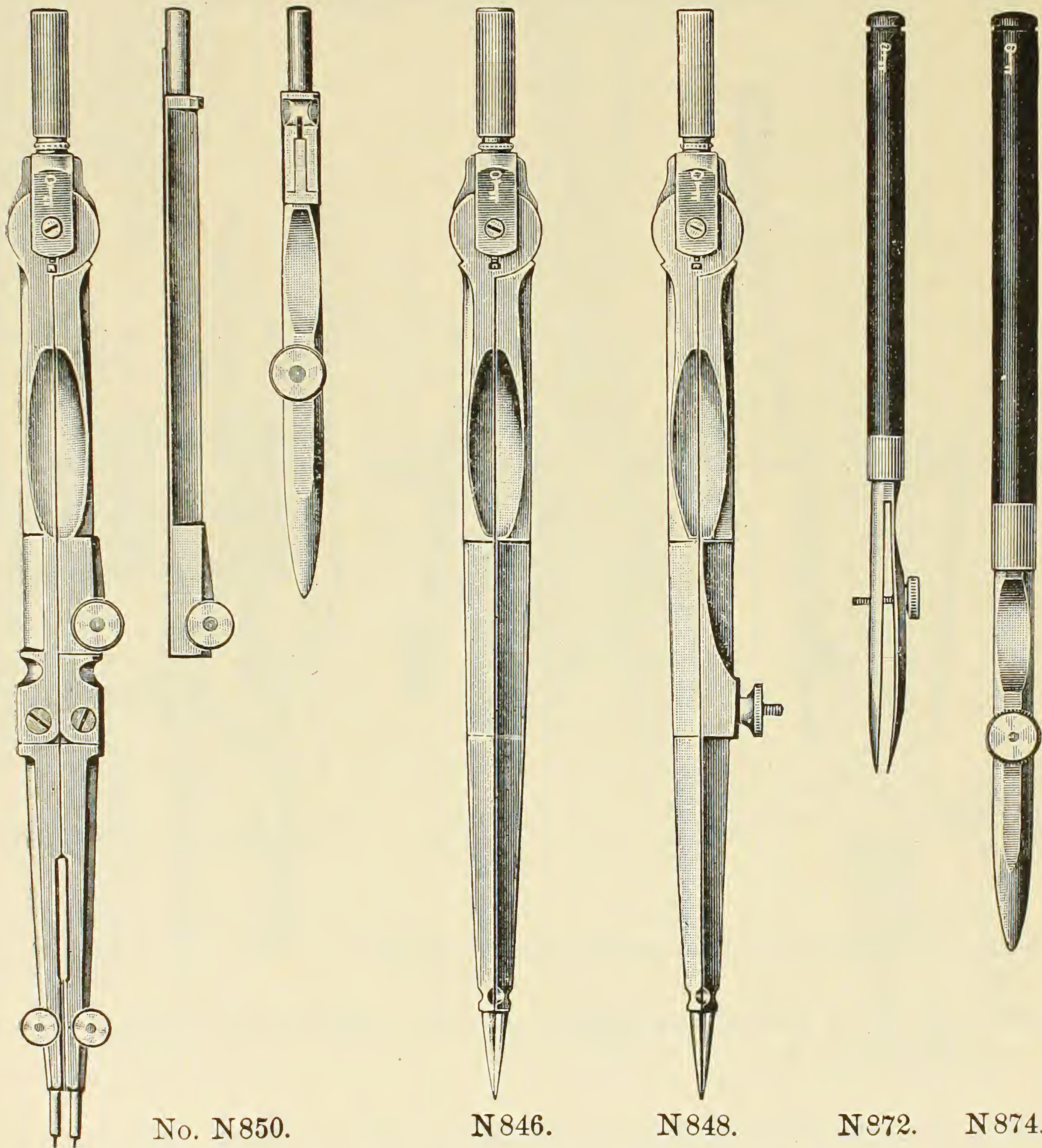
(SQUARE TYPE)

"TRADE  MARK"

**Extra Fine Instruments with Pivot Joints and Straightening Device.
Rolled Nickel Silver, Highly Finished.**

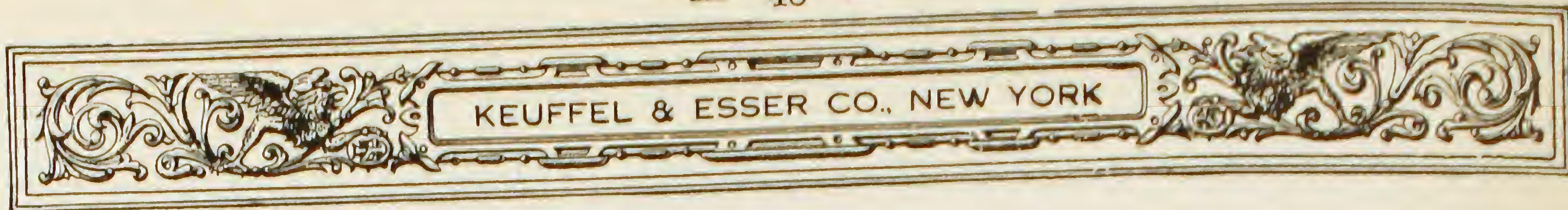
The heads of the compasses and dividers have the pivot joint with set screws described on page 8. The knee joints of these instruments are provided with steel plates, which reduce wear and friction, promote smoothness of operation and insure against looseness of the joint.

Each instrument stamped with trade-mark 



- | | | |
|------------|---|---------|
| No. N 850. | Compasses, 6 $\frac{1}{4}$ in., fixed Needle Point, Pen Point with spring blade, Pencil Point, Lengthening Bar, 2 Shouldered Needles..... | each \$ |
| N 846. | Plain Divider, 6 in. | " |
| N 848. | Hairspring Divider, 6 in. | " |
| N 872. | Drawing Pen, Ebonized Handle, upper blade with spring 4 $\frac{1}{2}$ in. " | " |
| N 874. | " " " " " " " " 5 $\frac{1}{2}$ " " | " |

For requisites of good drawing instruments, see pages 2 to 13.




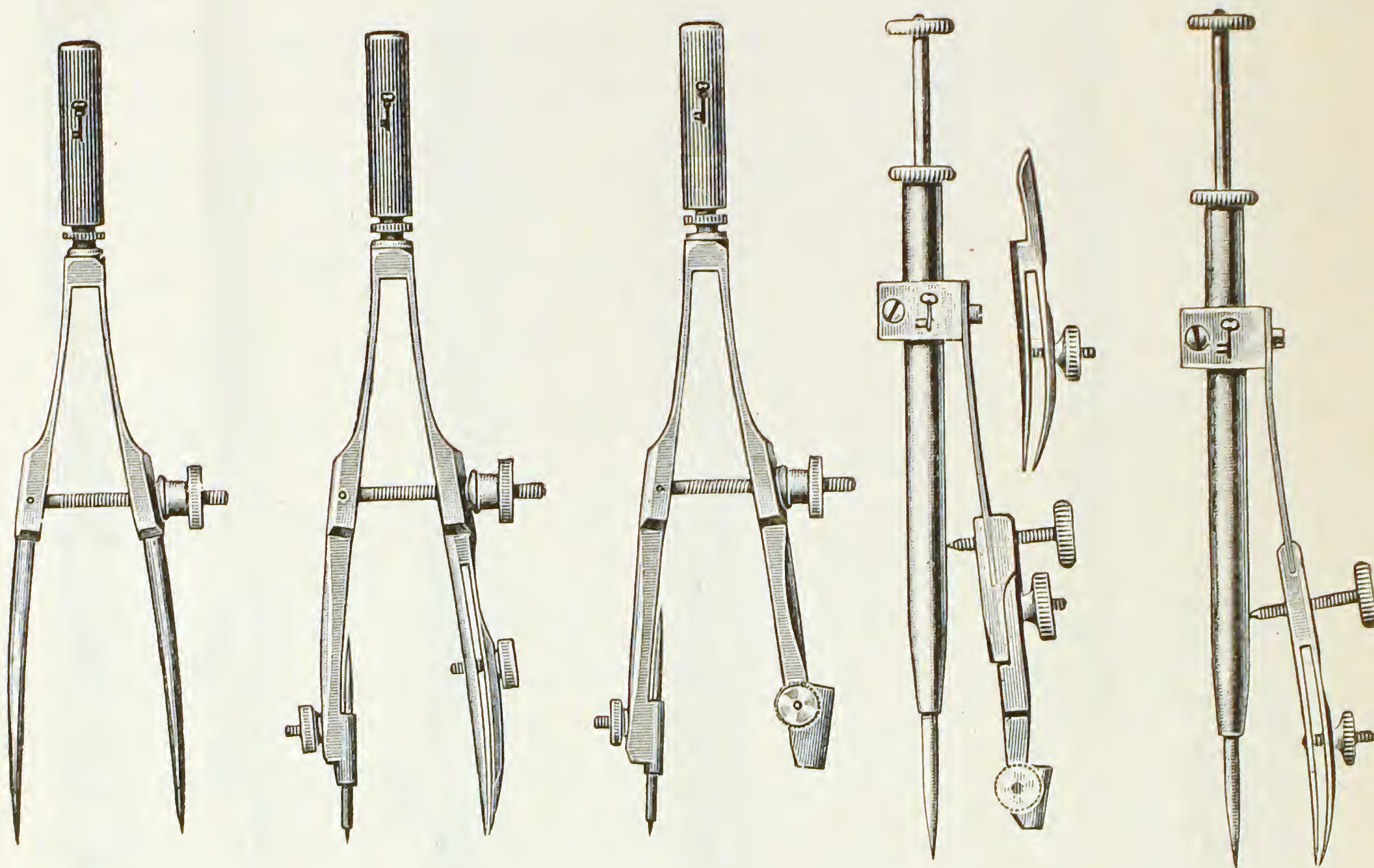
KEY DRAWING INSTRUMENTS.

(SQUARE TYPE)

“TRADE  MARK”

EXTRA FINE INSTRUMENTS OF ROLLED NICKEL SILVER,
HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. N860.

No. N861.

No. N862.

No. N863.

No. N864.

N 860. Bow Divider, $3\frac{1}{2}$ in., nickel silver Handle.....each \$

N 861. Bow Pen, with Spring Blade, $3\frac{1}{2}$ in., with Needle Point, nickel silver Handle.....“

N 862. Bow Pencil, $3\frac{1}{2}$ in., with Needle Point, nickel silver Handle. “

N 863. Drop Bow Pen with spring blade, 4 in.,.....“

N 864. Drop Bow Pen and Pencil, pen with spring blade, 4 in.....“

For requisites of good drawing instruments, see pages 2 to 13.



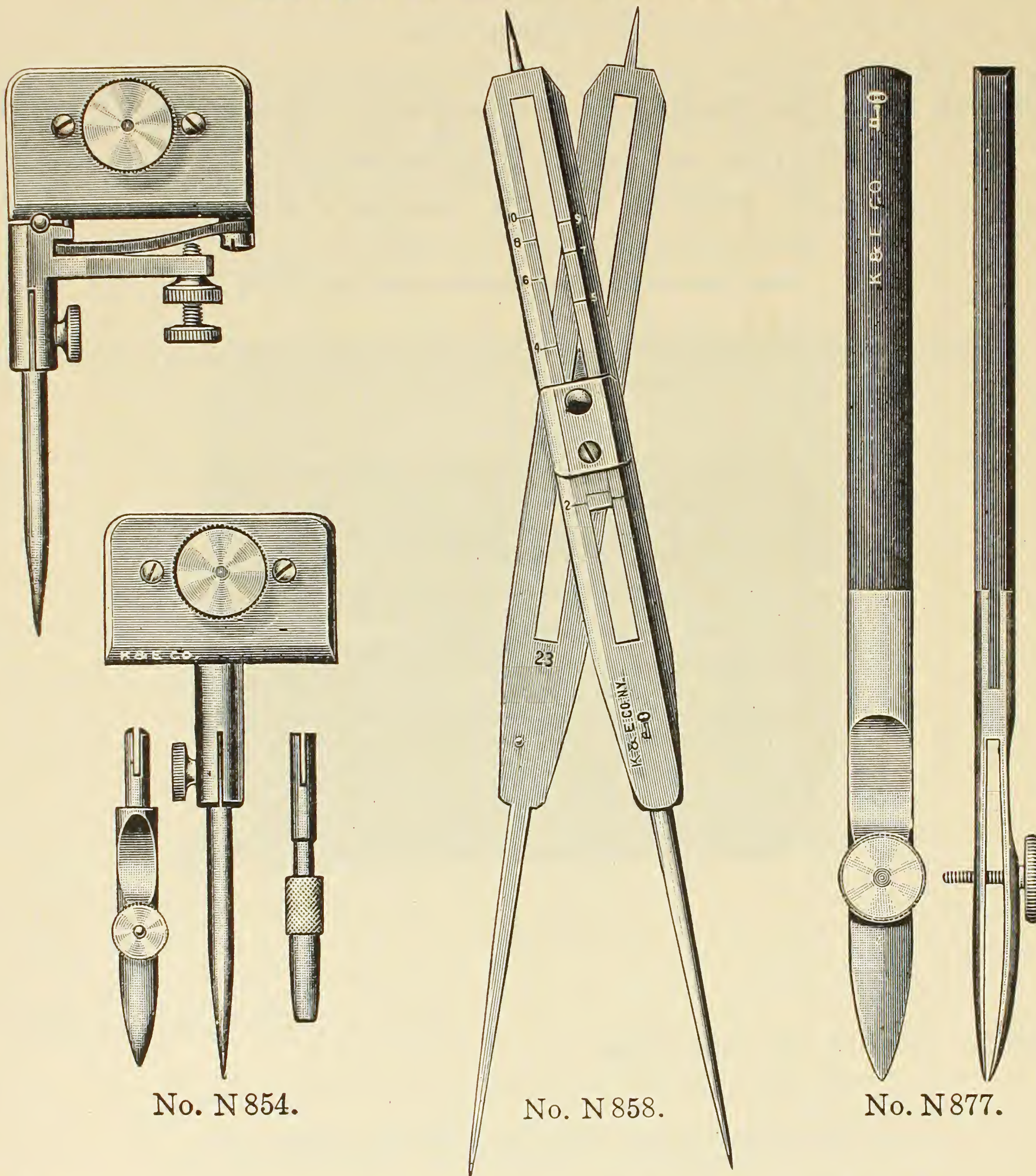
KEY DRAWING INSTRUMENTS.

(SQUARE TYPE)

"TRADE  MARK"

EXTRA FINE INSTRUMENTS OF ROLLED NICKEL SILVER,
HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. N 854.

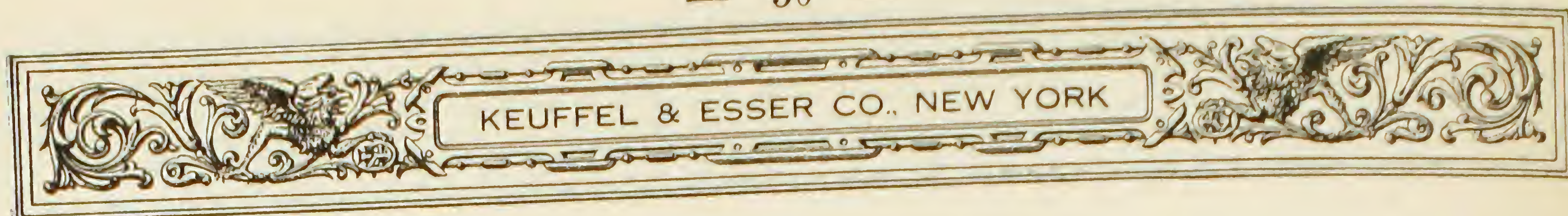
No. N 858.

No. N 877.

- N 854. Beam Compasses, to fit on a bar or straightedge, with Pen,
(Spring Blade) Pencil, two Needle Points and Micrometer
Adjustment..... each \$
- N 858. Proportional Dividers, 7 in., for lines..... “
- N 877. Detail Drawing Pen, 6 in., upper blade with spring, flat
Ebonized Handle..... “

For requisites of good drawing instruments, see pages 2 to 13.


For Hardwood Bars for Beam Compasses, see page 27.



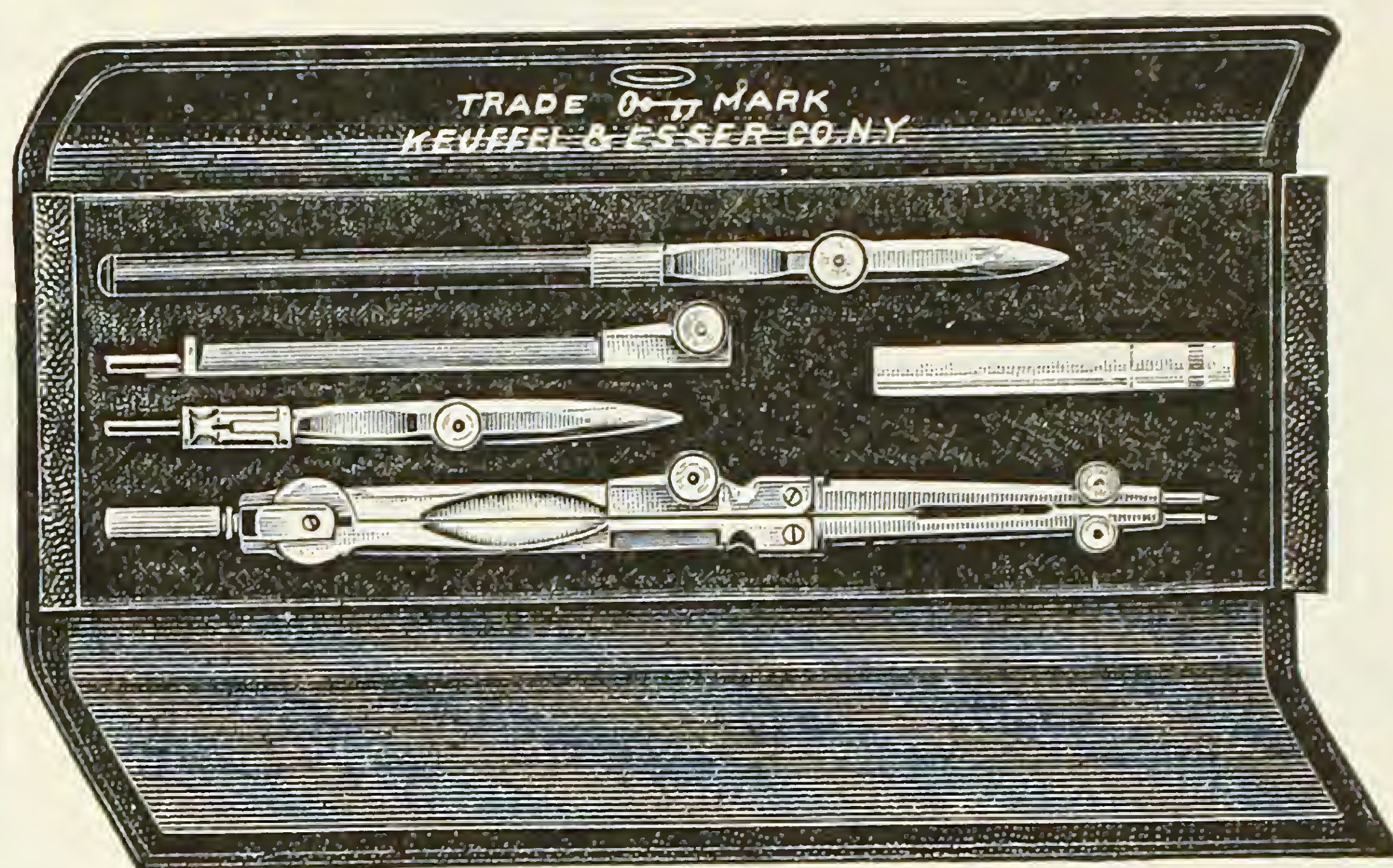
KEY DRAWING INSTRUMENTS. (SQUARE TYPE)

“TRADE  MARK”

EXTRA FINE INSTRUMENTS WITH PIVOT JOINTS, STEEL KNEE
PLATES, AND STRAIGHTENING DEVICE,
ROLLED NICKEL SILVER, HIGHLY FINISHED.

Each instrument stamped with trade-mark 

IN MOROCCO FINISH POCKET CASES, WITH VELVET LINING.



No. 890.

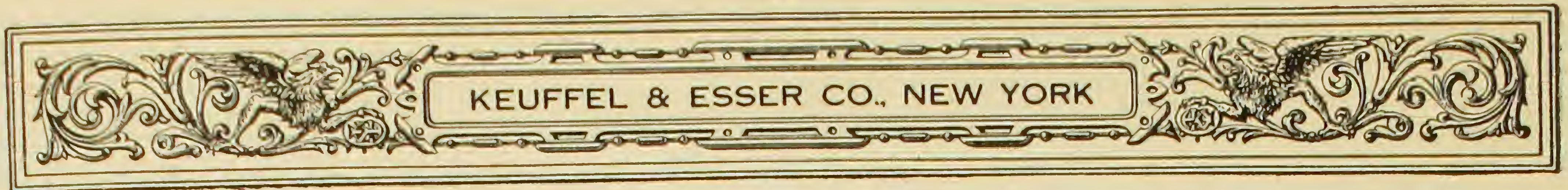
N 890. Pocket Case containing:—

1 Compasses $6\frac{1}{4}$ in., with fixed Needle Point, Pen,

Pencil Point, and Lengthening Bar, No. N 850.

1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No. N 874.

1 Nickel silver Box with 3 Leadseach, \$



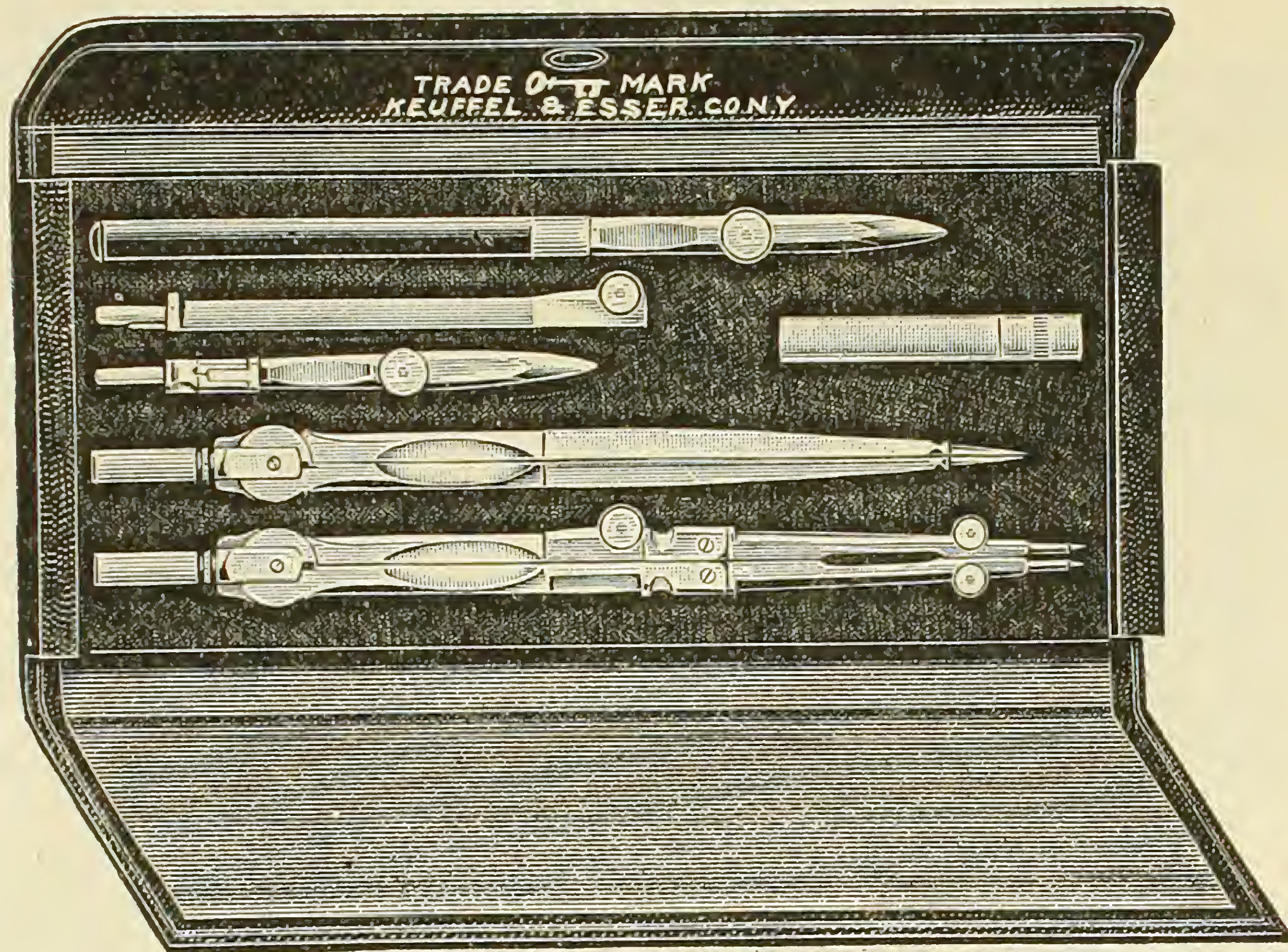
KEY DRAWING INSTRUMENTS.

(SQUARE TYPE)

“TRADE  MARK”

EXTRA FINE INSTRUMENTS WITH PIVOT JOINTS, STEEL KNEE
PLATES, AND STRAIGHTENING DEVICE,
ROLLED NICKEL SILVER, HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. 892.

N 892. Pocket Case containing:—

1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen,

Pencil Point, and Lengthening Bar, No. N 850.

1 Plain Divider, 6 in., No. N 846.

1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No. N 874.


1 Nickel silver Box with 3 Leads each, \$

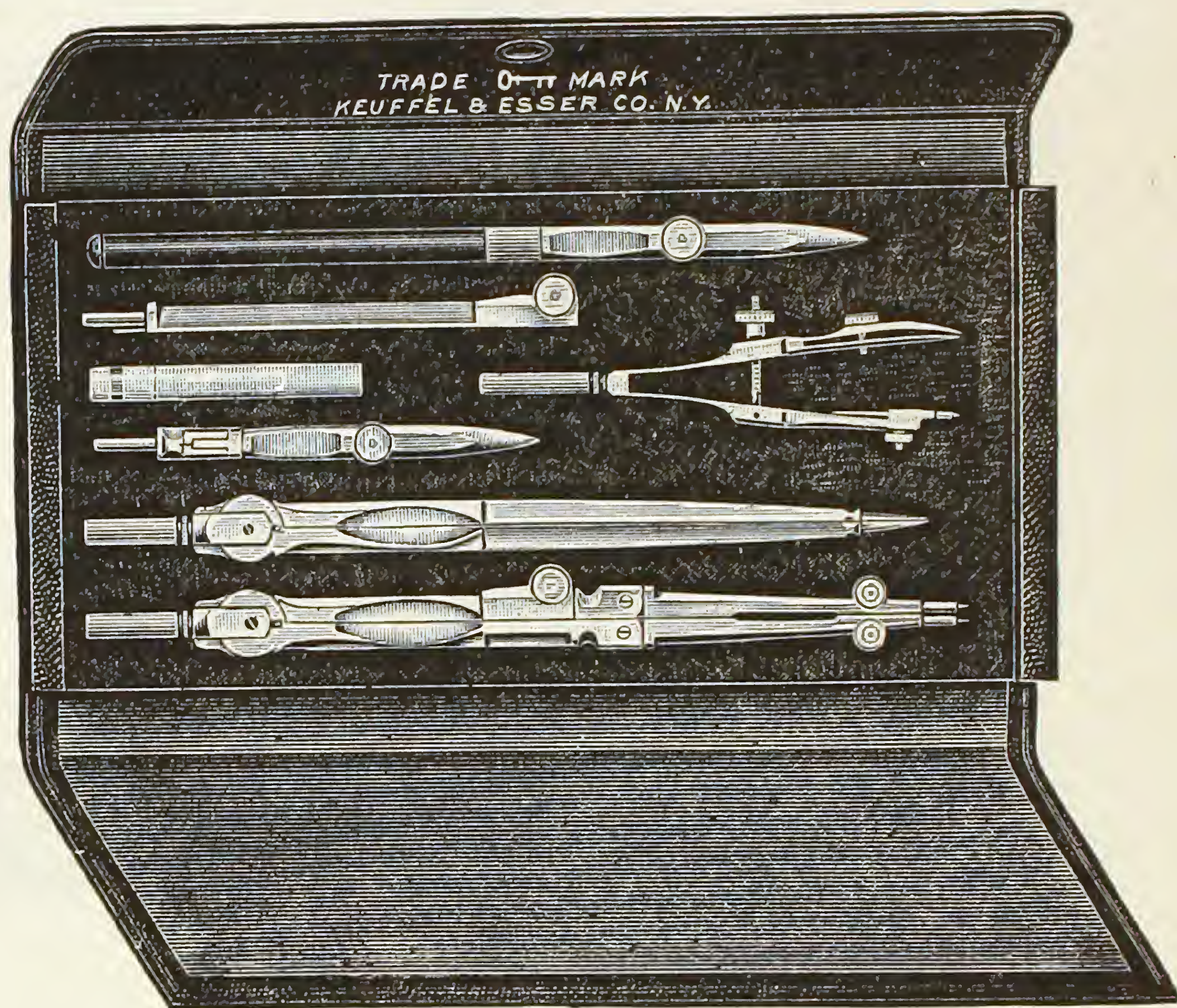
KEUFFEL & ESSER CO., NEW YORK

KEY DRAWING INSTRUMENTS. (SQUARE TYPE)

“TRADE  MARK”

EXTRA FINE INSTRUMENTS WITH PIVOT JOINTS, STEEL KNEE
PLATES, AND STRAIGHTENING DEVICE.
ROLLED NICKEL SILVER, HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. 894.

N 894. Pocket Case containing:—

- 1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen,
Pencil Point, and Lengthening Bar, No. N 850.
- 1 Plain Divider, 6 in., No. N 846.
- 1 Spring Bow Pen, $3\frac{1}{2}$ in., No. N 861.
- 1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No. N 874.
- 1 Nickel silver Box with 3 Leads, each, \$



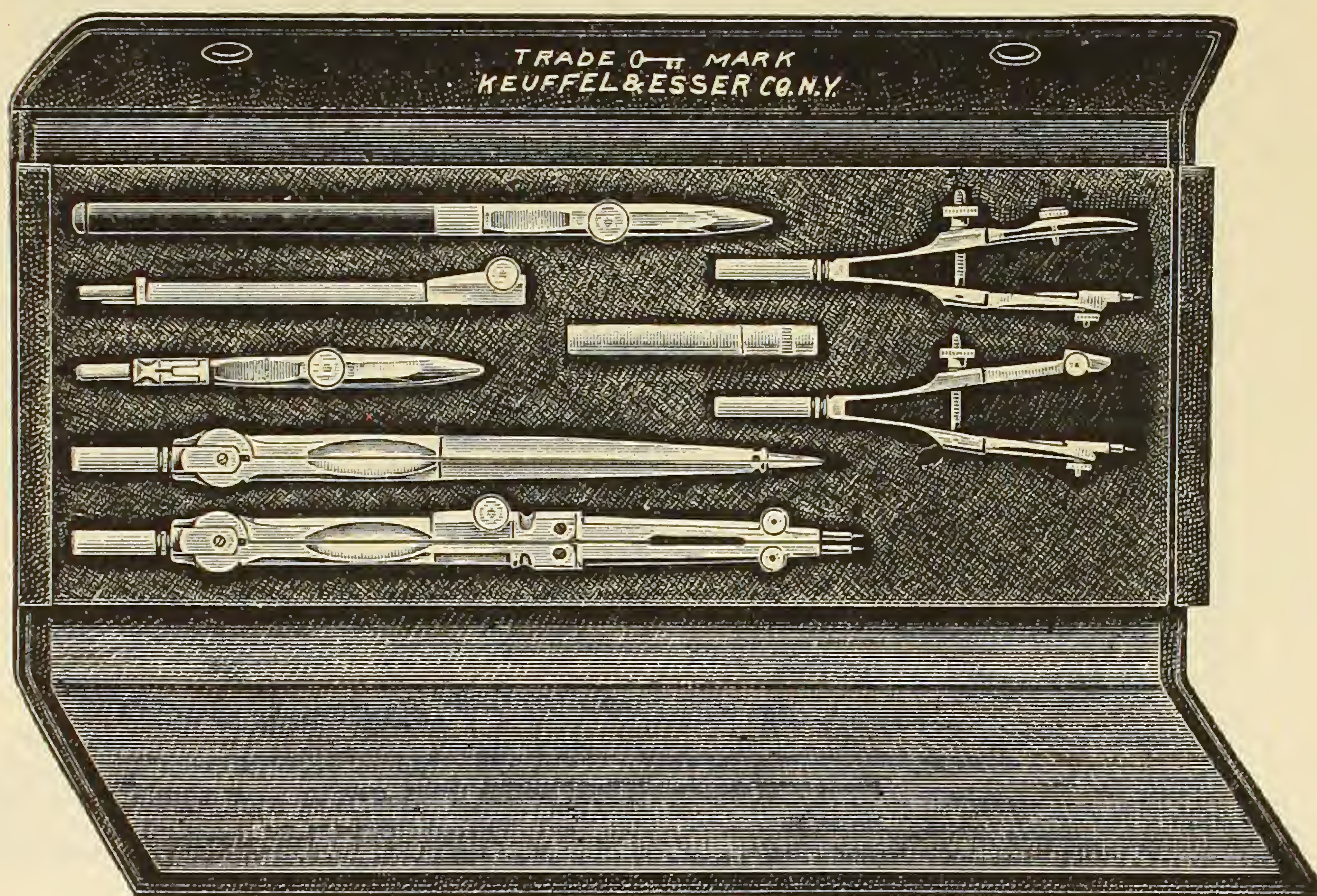
KEY DRAWING INSTRUMENTS.

(SQUARE TYPE)

"TRADE  MARK"

EXTRA FINE INSTRUMENTS WITH PIVOT JOINTS, STEEL KNEE
PLATES, AND STRAIGHTENING DEVICE,
ROLLED NICKEL SILVER, HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. 894 $\frac{1}{2}$.

894 $\frac{1}{2}$. Pocket Case containing:—

- 1 Compasses, 6 $\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil
Point and Lengthening Bar, No. N 850.
- 1 Plain Divider, 6 in., No. N 846.
- 1 Spring Bow Pen, 3 $\frac{1}{2}$ in., No. N 861.
- 1 Spring Bow Pencil, 3 $\frac{1}{2}$ in., No. N 862.
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring, No. N 874.
- 1 Nickel silver Box with 3 Leads each, \$

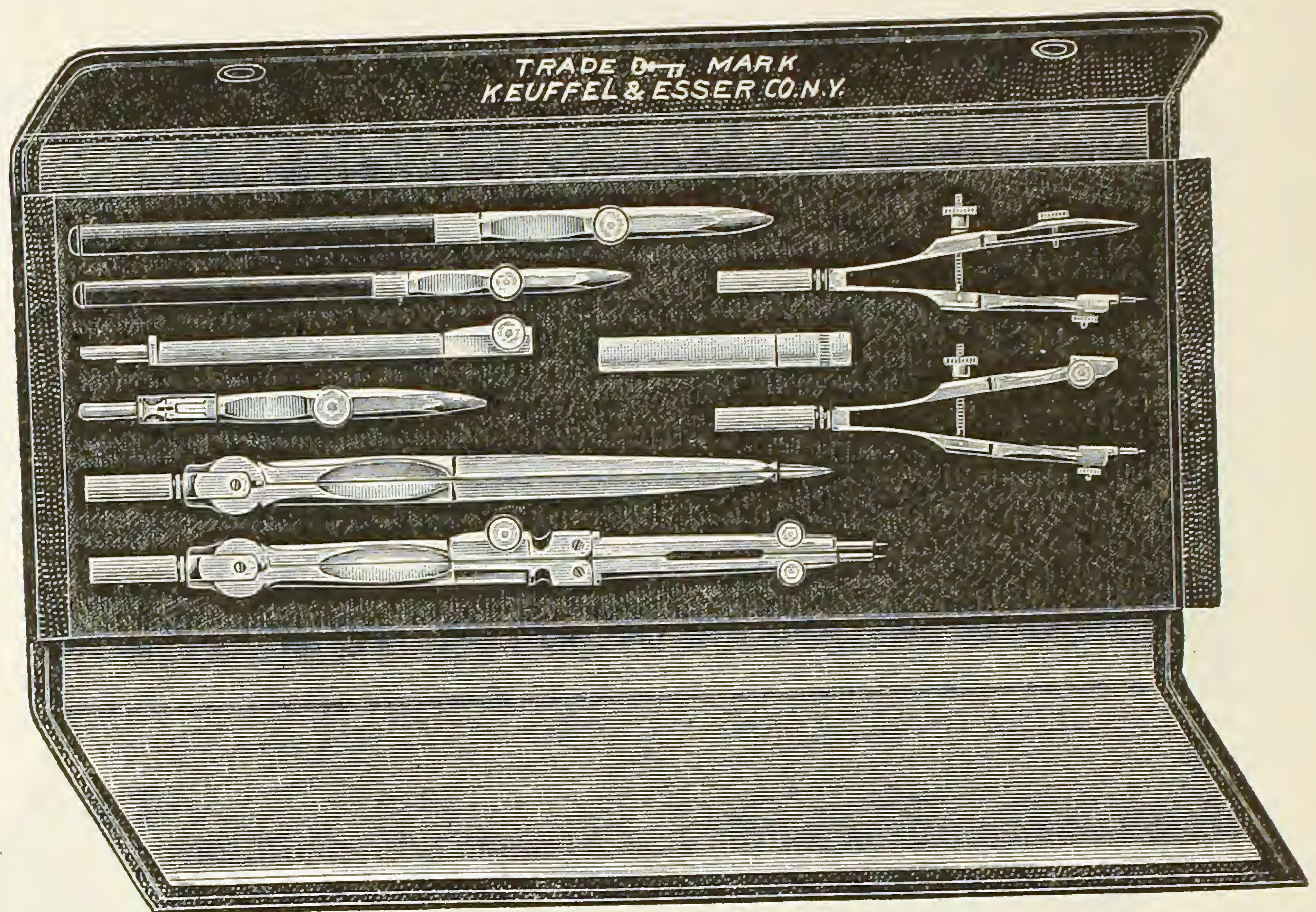


KEY DRAWING INSTRUMENTS. (SQUARE TYPE)

"TRADE  MARK"

EXTRA FINE INSTRUMENTS WITH PIVOT JOINTS, STEEL KNEE
PLATES, AND STRAIGHTENING DEVICE,
ROLLED NICKEL SILVER, HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. 895.

895. Pocket Case containing:—

- 1 Compasses 6 $\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil
Point and Lengthening Bar, No. N 850.
- 1 Plain Divider, 6 in., No. N 846.
- 1 Spring Bow Pen, 3 $\frac{1}{2}$ in., No. N 861.
- 1 Spring Bow Pencil, 3 $\frac{1}{2}$ in., No. N 862.
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring, No. N 874.
- 1 Drawing Pen, 4 $\frac{1}{2}$ in., do. do. do. do. No. N 872.
- 1 Nickel silver Box with 3 Leads. each, \$



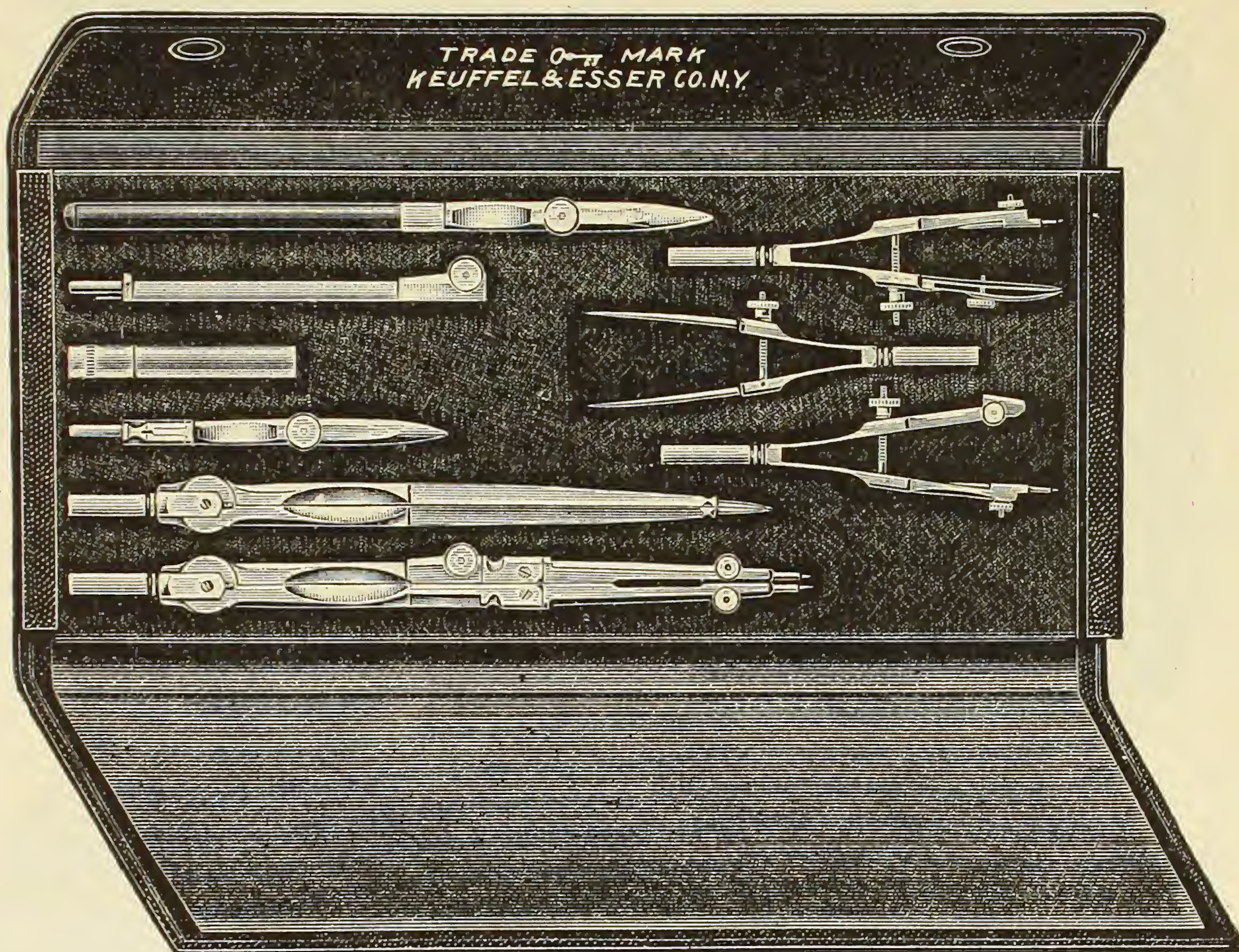
KEY DRAWING INSTRUMENTS.

(SQUARE TYPE)

“TRADE  MARK”

EXTRA FINE INSTRUMENTS WITH PIVOT JOINTS, STEEL KNEE PLATES, AND STRAIGHTENING DEVICE, ROLLED NICKEL SILVER, HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. 895 $\frac{1}{2}$.


895 $\frac{1}{2}$. Pocket Case containing:—

- 1 Compasses, 6 $\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 850.
- 1 Plain Divider, 6 in., No. N 846.
- 1 Spring Bow Pen, 3 $\frac{1}{2}$ in., No. N861.
- 1 Spring Bow Pencil, 3 $\frac{1}{2}$ in., No. N862.
- 1 Spring Bow Dividers, 3 $\frac{1}{2}$ in., No. N860.
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring, No. N874.
- 1 Nickel silver Box with 3 Leads each, \$

KEUFFEL & ESSER CO. NEW YORK

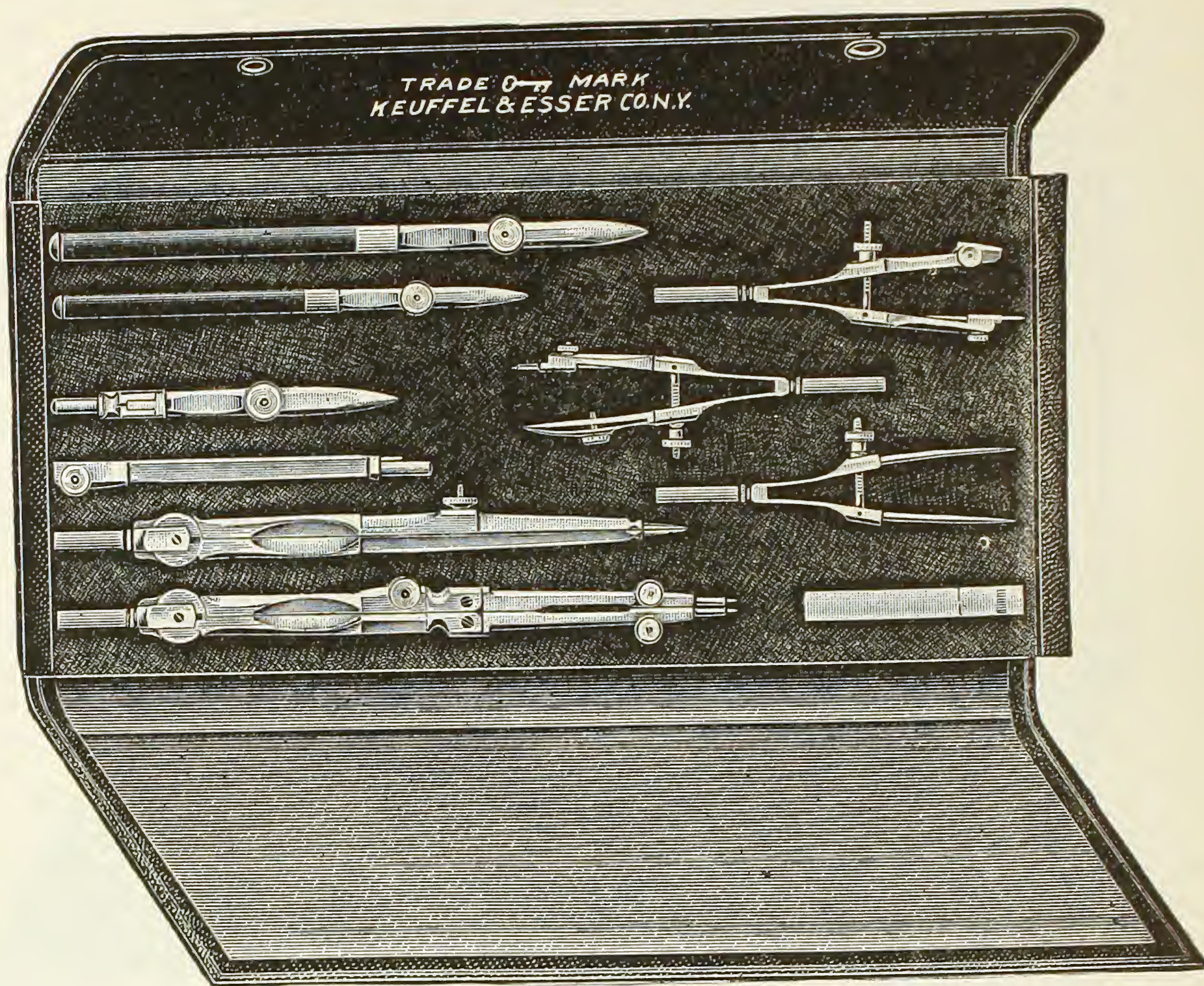
KEY DRAWING INSTRUMENTS.

(SQUARE TYPE)

“TRADE  MARK”

EXTRA FINE INSTRUMENTS WITH PIVOT JOINTS, STEEL KNEE
PLATES AND STRAIGHTENING DEVICE,
ROLLED NICKEL SILVER, HIGHLY FINISHED.

Each instrument stamped with trade-mark 



No. 896.

896. Pocket Case containing:—

- 1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 850.
- 1 Hairspring Divider, 6 in., No. N 848.
- 1 Spring Bow Pen, $3\frac{1}{2}$ in., No. N861.
- 1 Spring Bow Pencil, $3\frac{1}{2}$ in., No. N862.
- 1 Spring Bow Dividers, $3\frac{1}{2}$ in., No. N860.
- 1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No. N874.
- 1 Drawing Pen, $4\frac{1}{2}$ in., do. do. do. No. N872.
- 1 Nickel silver Box with 3 Leads.....each, \$

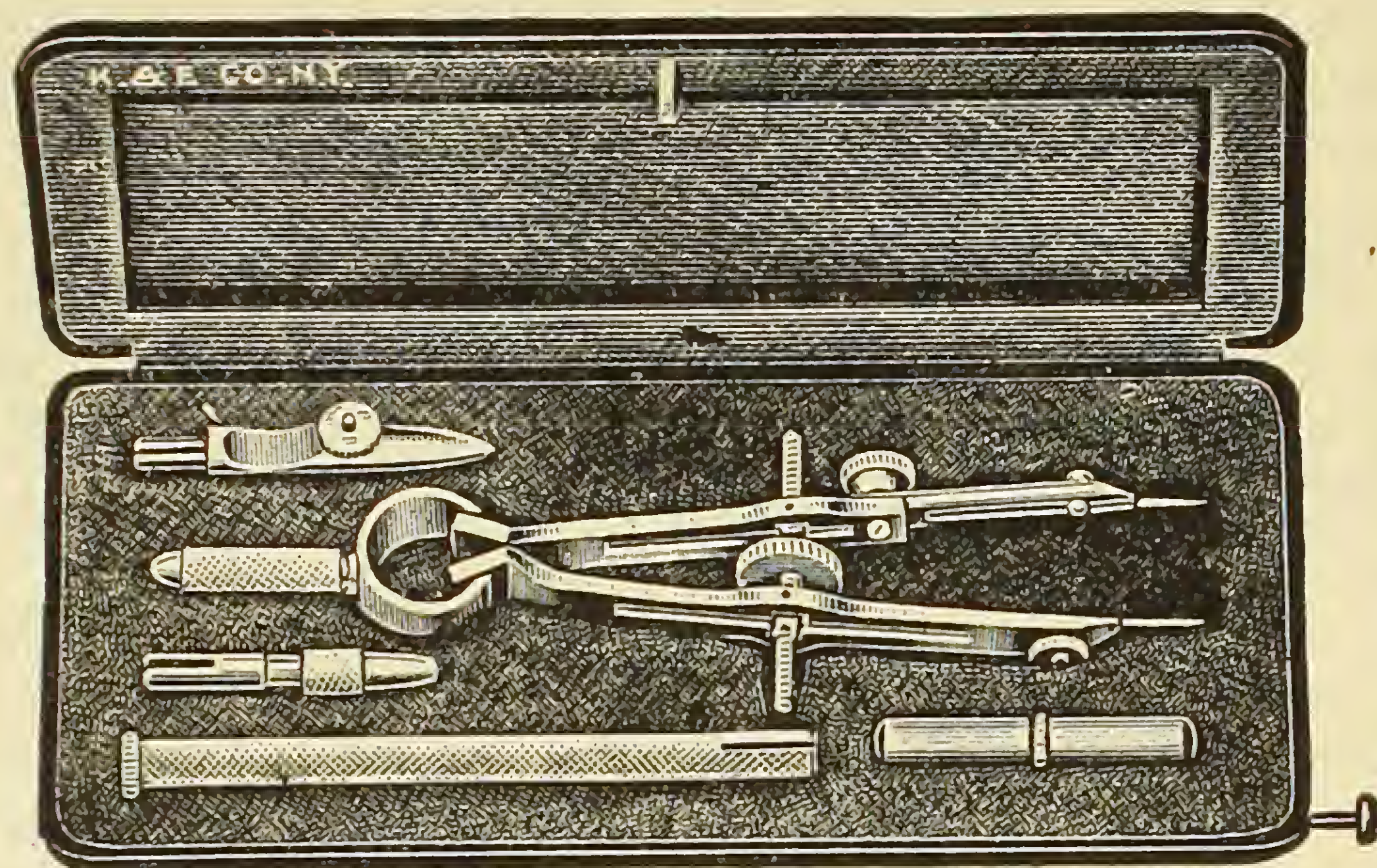


KEY DRAWING INSTRUMENTS.

“TRADE  MARK”

SPECIAL POCKET BOW SET, ROLLED NICKEL SILVER.

A very handy set for general purposes.



No. 800.

800. Pocket Set, in Velvet Lined Bar-Lock Case, $5\frac{1}{4}$ x $2\frac{1}{2}$ in.,
containing:—

1 Steelspring Bow Divider, with central thumbnut, 4 in.,
with fixed Needle Point, Pen and Pencil Point,

1 Handle for Pen and Pencil Point, nickel silver, $2\frac{7}{8}$
in., with reservoir for Needles, closed by screw cap,
containing extra needle-points,

1 Lead Box, nickel-silver, containing 3 leads each, \$

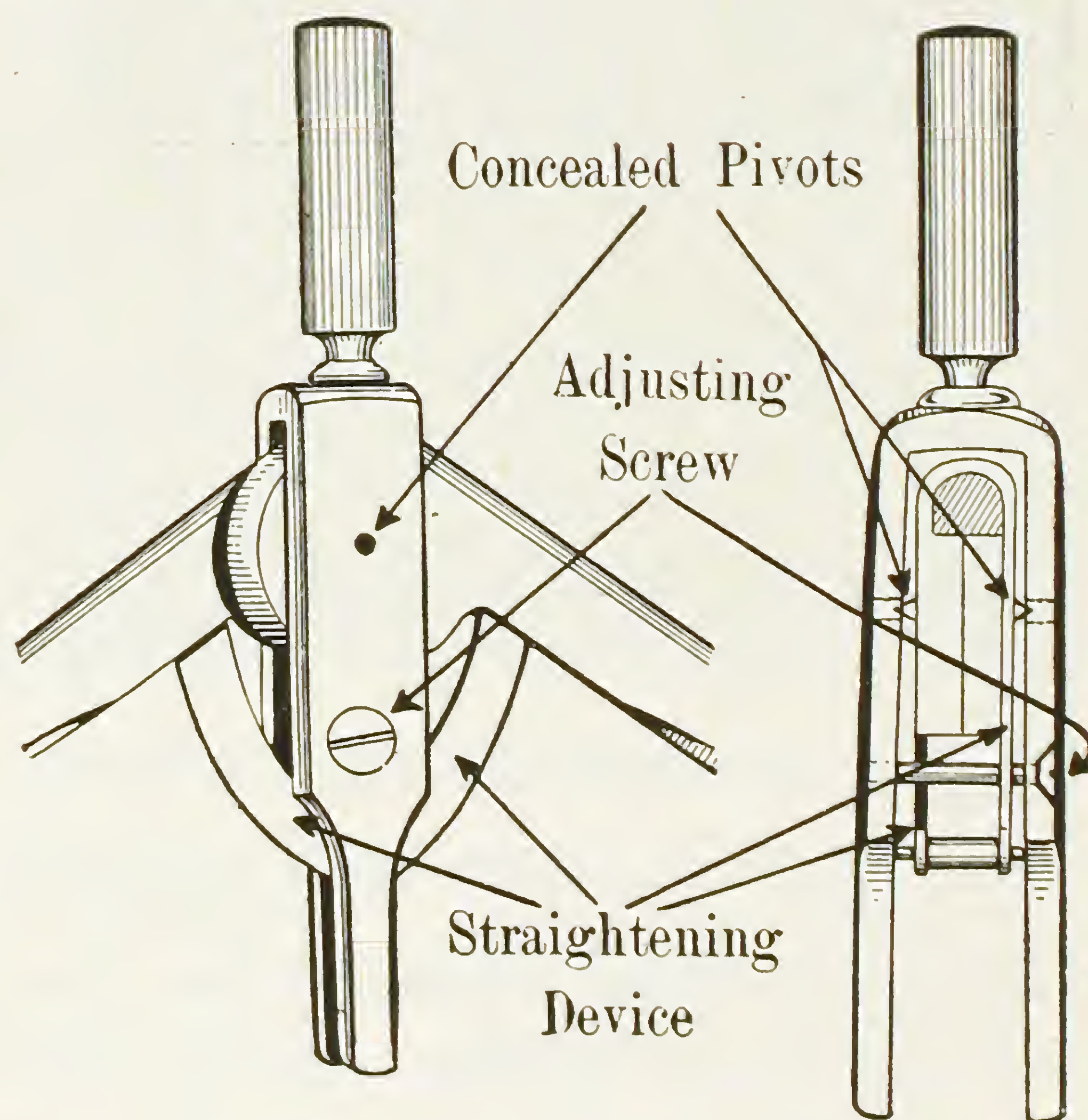
AMERICAN MADE DRAWING INSTRUMENTS

When the Great War suddenly shut off the usual sources of supply, we found it necessary to begin the manufacture of drawing instruments. We created a special department in our factory; equipped it with the most modern machinery and appliances, and proceeded with the manufacture of American-made drawing instruments. This special department has since grown into a complete unit, which employs a large number of workmen who are specialists in the art of making drawing instruments.

In the process of development, two distinct types have been evolved; *i. e.*, the round type, or Minusa (see pages 65 to 89), and the flat-type, or Anchor.

DRAWING PENS. The Anchor drawing pens are of hexagonal shape; the nibs accurately set and ground. Only the highest grade of tool steel, especially made for the purpose, is used; while an elaborate heat-treating equipment, with temperature control, insures proper hardness and temper.

COMPASSES. The head of the Anchor Compasses is of the concealed pivot-joint type, which is not only easily adjusted without direct action upon the pivots themselves, but maintains the correct relation between the friction of the various parts. A straightening device maintains the vertical position of the handle under all conditions. The various insertion pieces have the strong pentagonal shank and socket, as in our Paragon Instruments (see page 9). The several parts have the same serial number as the compasses, which is an aid to their identification by the owner.



SPRING BOWS. Anchor bows are of a type similar to our Paragon bows (see page 12). The finest tool steel is used as in the Anchor drawing pens; and the metal is hardened and tempered by the same automatically controlled process.



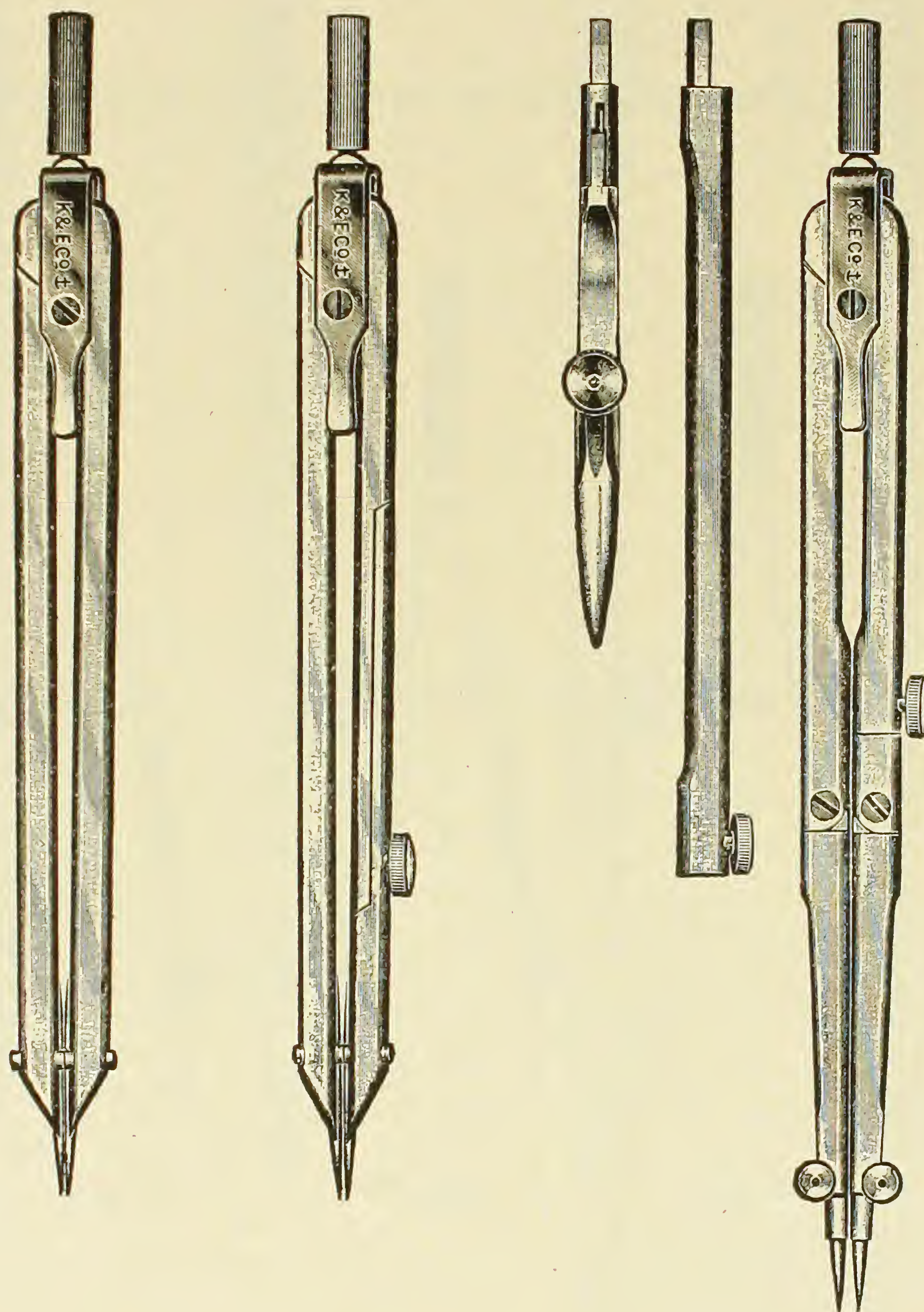
ANCHOR DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

(FLAT TYPE)

Made in U. S. A.

Each instrument stamped with trade mark  and K & E Co.



No. A 646.

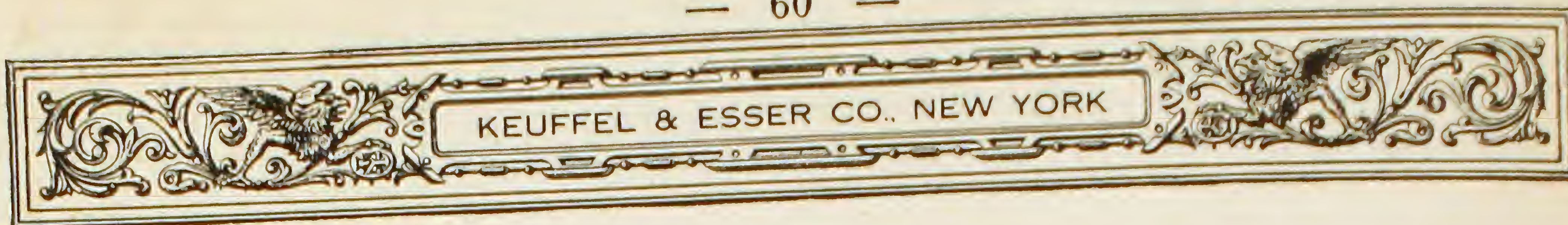
A 648.

A 650.

A 646. Plain Divider, $5\frac{3}{4}$ in. each \$

A 648. Hairspring Divider, $5\frac{3}{4}$ in. “

A 650. Compasses, $6\frac{1}{2}$ in., with fixed Needle and Pencil Point,
Pen and Lengthening Bar “



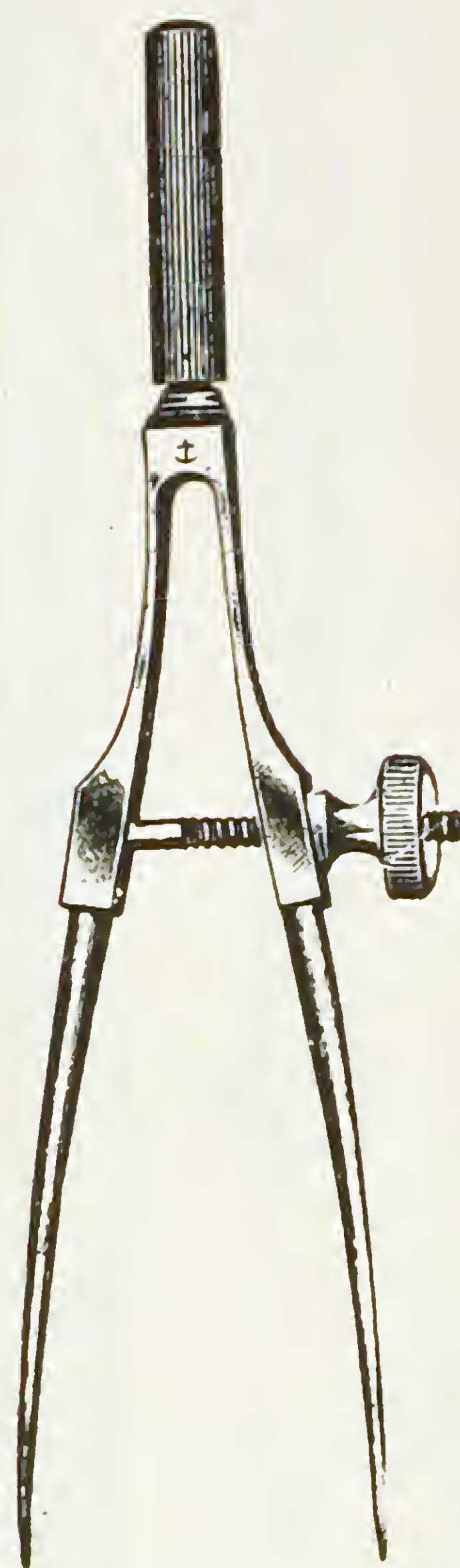
ANCHOR DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

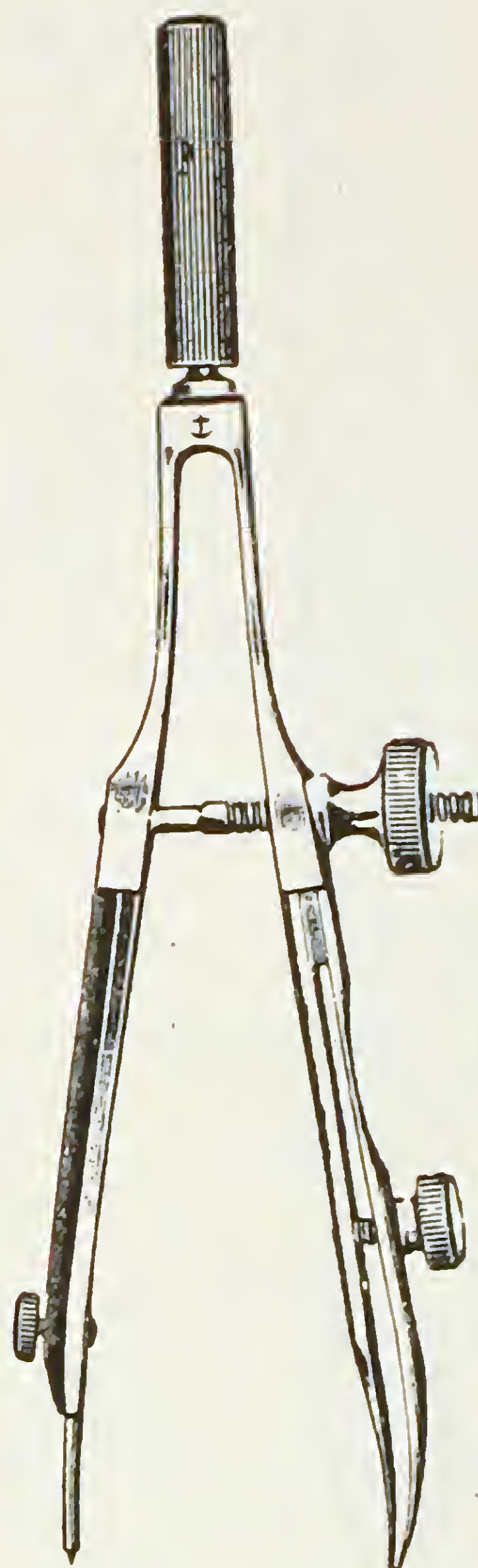
(FLAT TYPE)

Made in U. S. A.

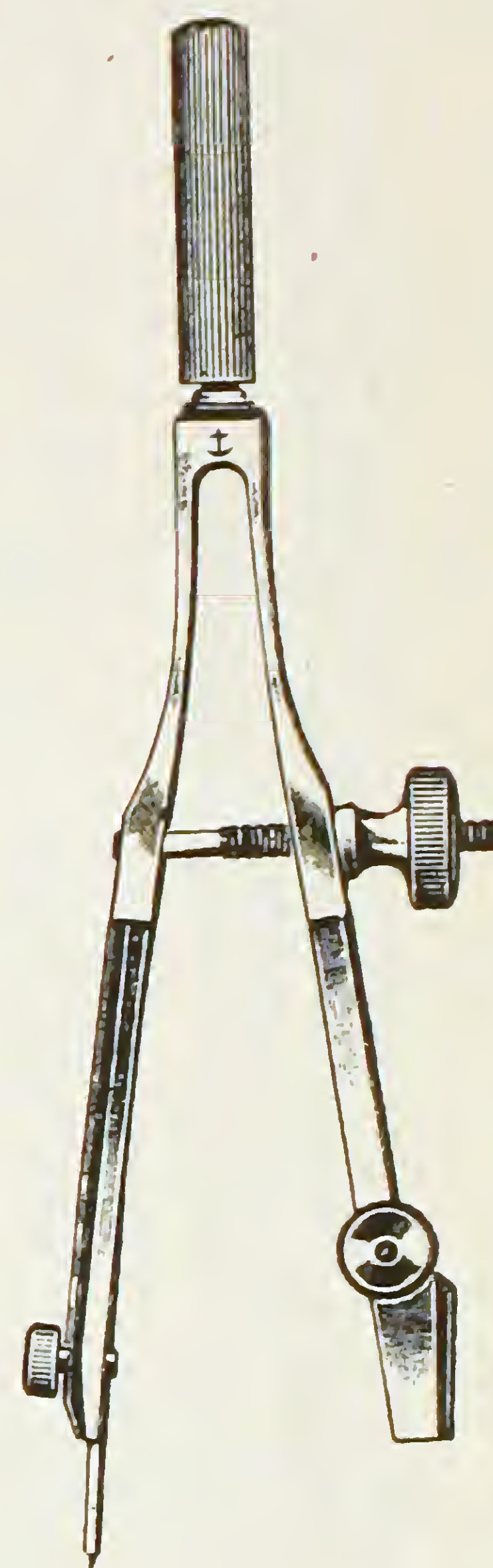
Each instrument stamped with trade mark ⚓ and K & E Co.



No. A 660.



A 661.



A 662.

A 660. Steelspring Bow Divider, $3\frac{1}{2}$ in., nickel silver Handle . . each \$

A 661. Steelspring Bow Pen, Spring Blade, $3\frac{1}{2}$ in., with Needle Point, nickel silver Handle “

A 662. Steelspring Bow Pencil, $3\frac{1}{2}$ in., with Needle Point, nickel silver Handle “




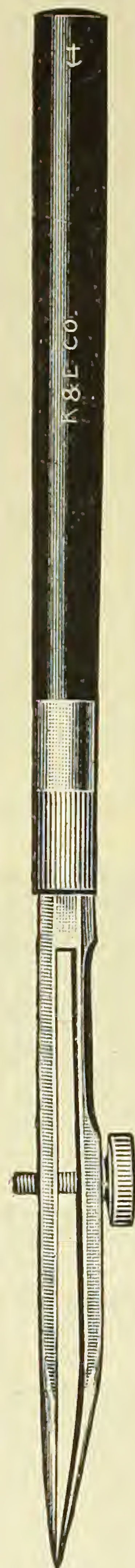
ANCHOR DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

(FLAT TYPE)

Made in U. S. A.

Each instrument stamped with trade mark  and K & E Co.



No. A 672.

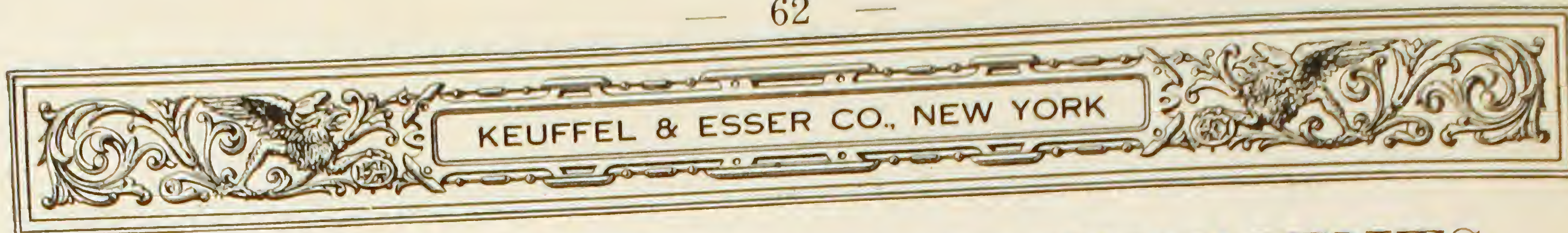
A 674.

A 672. Drawing Pen, upper blade with spring, $4\frac{1}{2}$ in. each \$

A 674. Drawing Pen, upper blade with spring, $5\frac{1}{2}$ in. “

559. Fine nickel silver Lead Box, screw cap, containing 6 leads. “

Drawing Pens carefully set and sharpened each \$



ANCHOR DRAWING INSTRUMENTS.

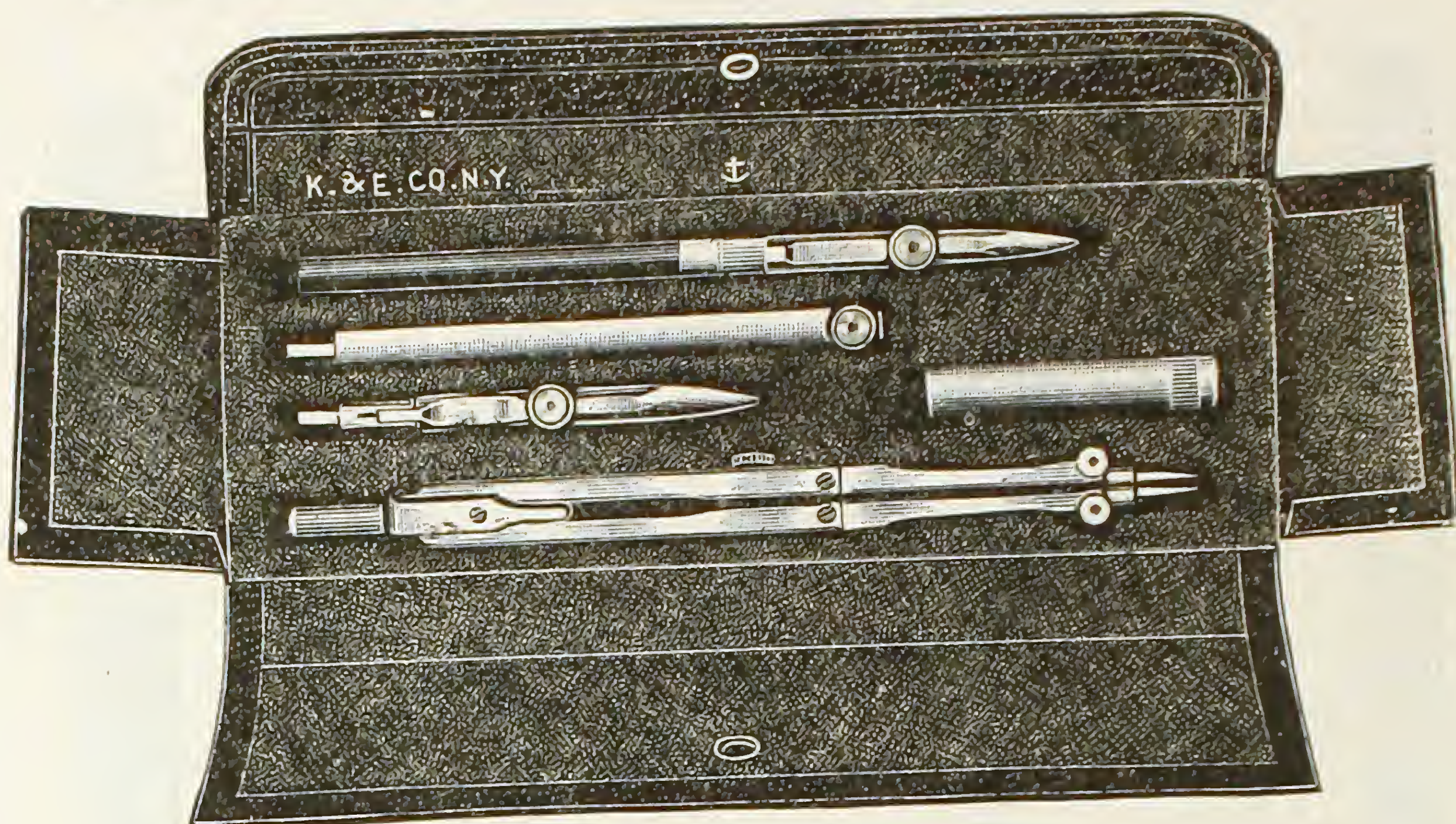
REG. U. S. PAT. OFF.

(FLAT TYPE)

Made in U. S. A.

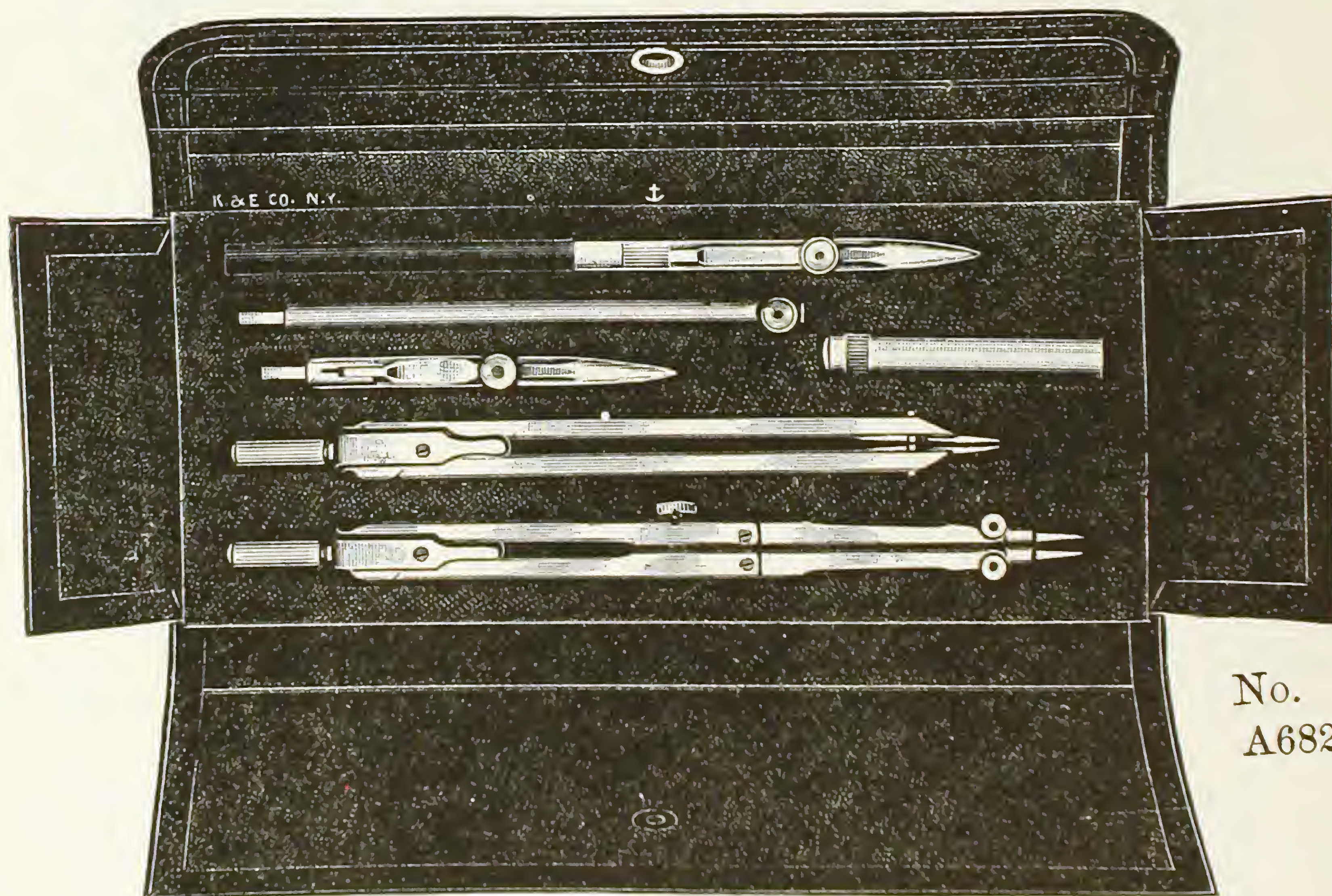
IN FINE MOROCCO POCKET CASES, SILK VELVET LINED.

Each instrument stamped with trade mark, ⚓ & K & E Co.



No.
A680.

- A 680.** Pocket Case with **folding flaps**, containing:-
 1 Compasses, $6\frac{1}{2}$ in., with fixed Needle Point, Pen,
 Pencil Point and Lengthening Bar, No. A 650,
 1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring,
 No. A 674,
 1 nickel silver Box with Leads, No. 559 each, \$



No.
A682.

- A 682.** Pocket Case with **folding flaps**, containing:-
 1 Compasses, $6\frac{1}{2}$ in., with fixed Needle Point, Pen,
 Pencil Point and Lengthening Bar, No. A 650,
 1 Plain Divider, $5\frac{3}{4}$ in., No. A 646,
 1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring,
 No. A 674,
 1 Nickel silver Box with Leads, No. 559, "



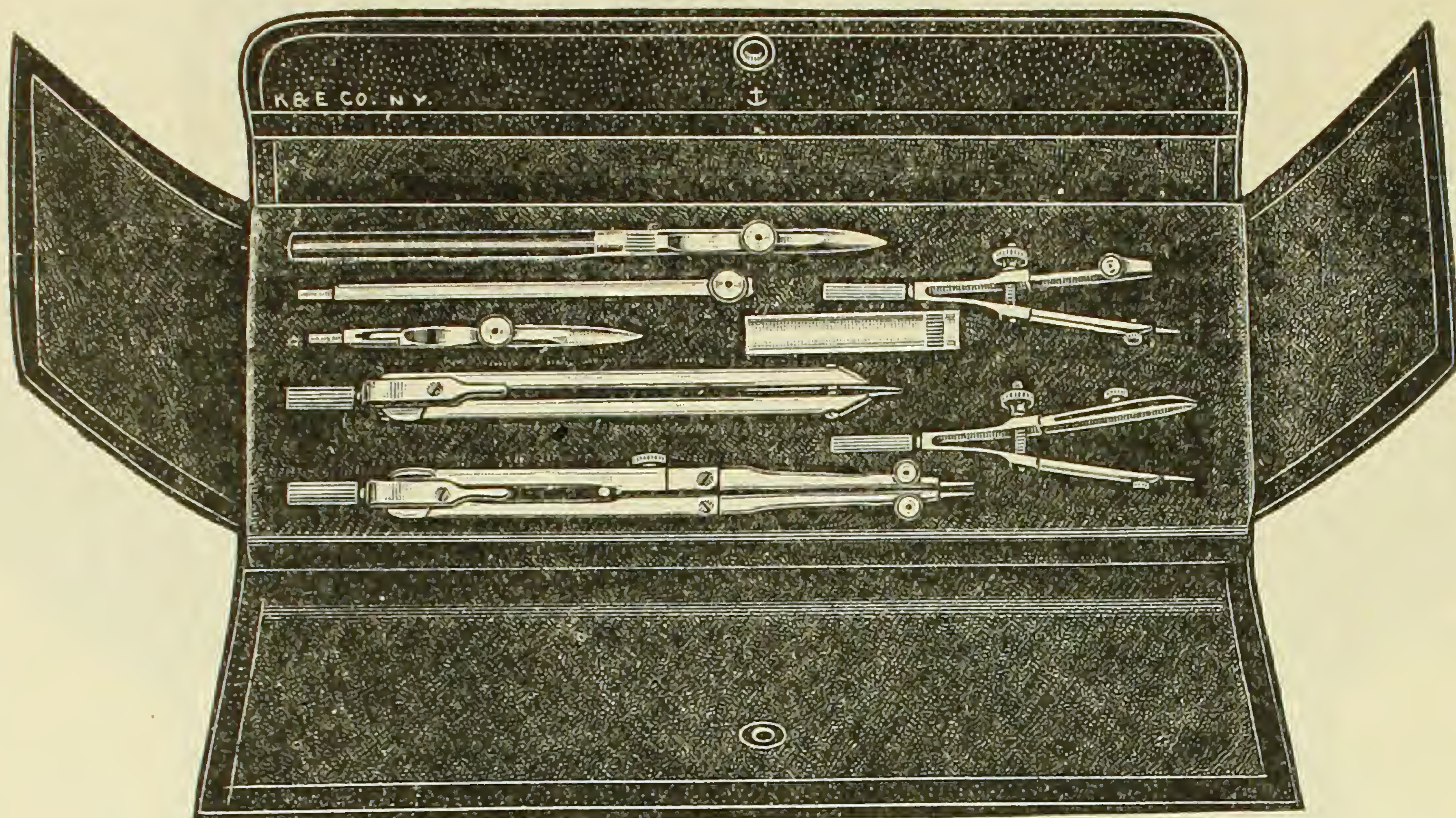
ANCHOR DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

(FLAT TYPE)

Made in U. S. A.

Each instrument stamped with trade mark  and K & E Co.



No. 684 $\frac{1}{2}$.

A 684. Pocket Case with **folding flaps**, containing:-

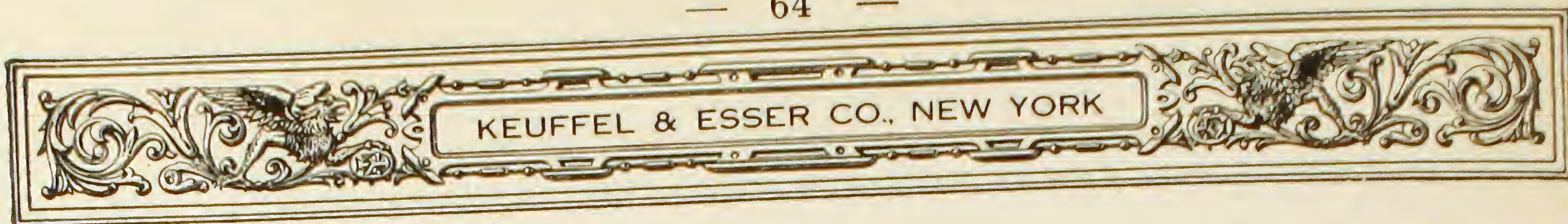
- 1 Compasses, 6 $\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. A 650,
- 1 Plain Divider, 5 $\frac{3}{4}$ in., No. A 646,
- 1 Steelspring Bow Pen, 3 $\frac{1}{2}$ in., No. A 661,
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring, No. A 674,
- 1 Nickel silver Box with Leads, No. 559, each, \$

A 684 $\frac{1}{2}$. Pocket Case with **folding flaps**, containing:-

- 1 Compasses, 6 $\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. A 650,
- 1 Plain Divider, 5 $\frac{3}{4}$ in., No. A 646,
- 1 Steelspring Bow Pen, 3 $\frac{1}{2}$ in., No. A 661,
- 1 Steelspring Bow Pencil, 3 $\frac{1}{2}$ in., No. A 662,
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring, No. A 674,
- 1 Nickel silver Box with Leads, No. 559, each, \$

A 685. Pocket Case with **folding flaps**, containing:-

- 1 Compasses, 6 $\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening bar, No. A 650,
- 1 Plain Divider, 5 $\frac{3}{4}$ in., No. A 646,
- 1 Steelspring Bow Pen, 3 $\frac{1}{2}$ in., No. A 661,
- 1 Steelspring Bow Pencil, 3 $\frac{1}{2}$ in., No. A 662,
- 1 Drawing Pen, 4 $\frac{1}{2}$ in., upper blade with spring, No. A 672,
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring, No. A 674,
- 1 Nickel silver Box with Leads, No. 559, each, \$



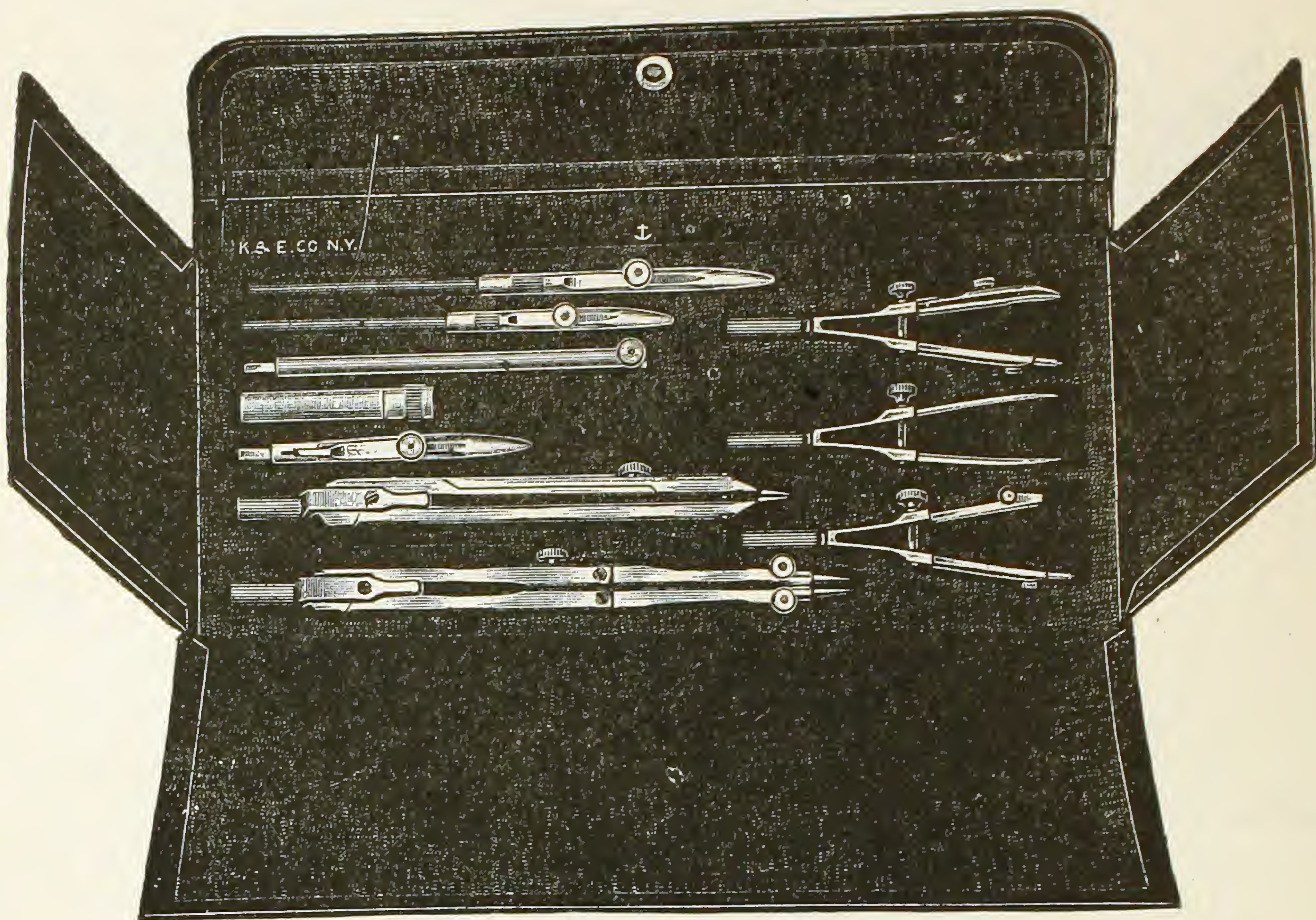
ANCHOR DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

(FLAT TYPE)

Made in U. S. A.

Each instrument stamped with trade mark  and K & E Co.



No. A 686.

A 685½. Pocket Case with **folding flaps**, containing:-

- 1 Compasses, 6½ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. A 650,
- 1 Plain Divider, 5¾ in., No. A 646,
- 1 Steelspring Bow Divider, 3½ in., No. A 660,
- 1 Steelspring Bow Pen, 3½ in., No. A 661,
- 1 Steelspring Bow Pencil, 3½ in., No. A 662,
- 1 Drawing Pen, 5½ in., upper blade with spring, No. A 674,
- 1 Nickel silver Box with Leads, No. 559, each, \$

A 686. Pocket Case with **folding flaps** (illustrated above), containing:-

- 1 Compasses, 6½ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. A 650,
- 1 Hairspring Divider, 5¾ in., No. A 648,
- 1 Steelspring Bow Divider, 3½ in., No. A 660,
- 1 Steelspring Bow Pen, 3½ in., No. A 661,
- 1 Steelspring Bow Pencil, 3½ in., No. A 662,
- 1 Drawing Pen, 4½ in., upper blade with spring, No. A 672,
- 1 Drawing Pen, 5½ in., upper blade with spring, No. A 674,
- 1 Nickel silver Box with Leads, No. 559, each, \$



MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

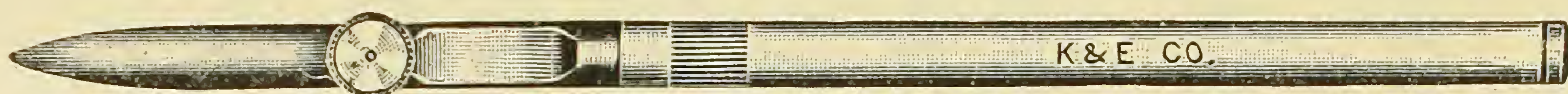
Our efforts to manufacture a high-grade instrument at minimum cost, have resulted in

MINUSA DRAWING INSTRUMENTS.

These instruments, which embody high quality, graceful design, perfect balance, fine finish and practicability, are not hand-made, but manufactured by automatic machinery. Hence, through exact uniformity of each part, obtained by the use of jigs and precision tools, **all parts are made interchangeable. This means that parts which will perfectly fit any of these instruments may be purchased from the nearest dealer;** thus doing away with the delays which result from the necessity of sending instruments to the factory to have new parts fitted.

MINUSA AND MINUSA *Special* RULING PENS.

A specially equipped division of our factory takes care of the grinding, polishing and sharpening of these instruments.



Minusa No. N 772.



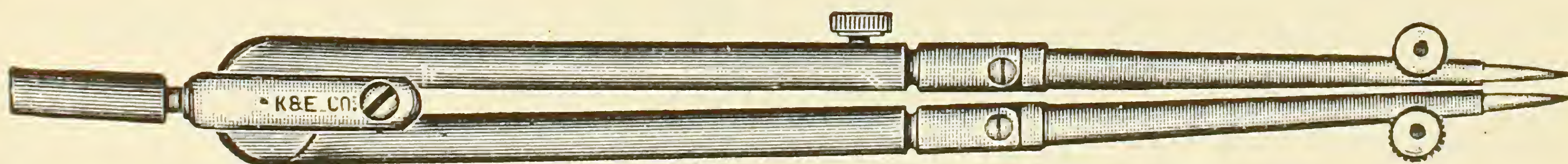
Minusa Special No. N 772 1/2.

MINUSA and **MINUSA *Special*** ruling pens are made of the best quality high-grade tool steel, manufactured especially for the purpose, in accordance with our own specifications. Not only has our laboratory gone into the selection of the proper steel very exhaustively, but we have installed a most elaborate heat-treating equipment, which, by means of temperature control apparatus, enables us to subject our steel instruments to the proper heat treatment. These advantages make for uniformity, which ensures the proper hardness and temper of each part.

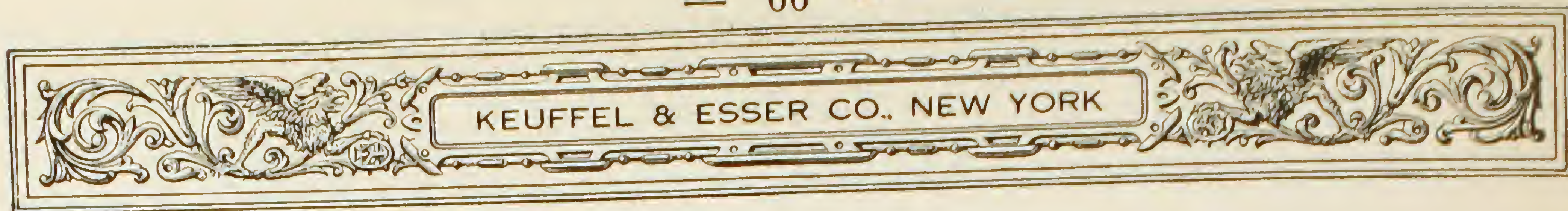
MINUSA ruling pens are made in 4 1/2" and 5" lengths (see page 75). The blades are rounded on the outer surfaces, and the outer blade is provided with a spring.

MINUSA *Special* ruling pens are hexagonal in form and the pens are more highly finished and handsomer in appearance than the regular Minusa pen made of round stock (see page 76).

MINUSA COMPASSES.

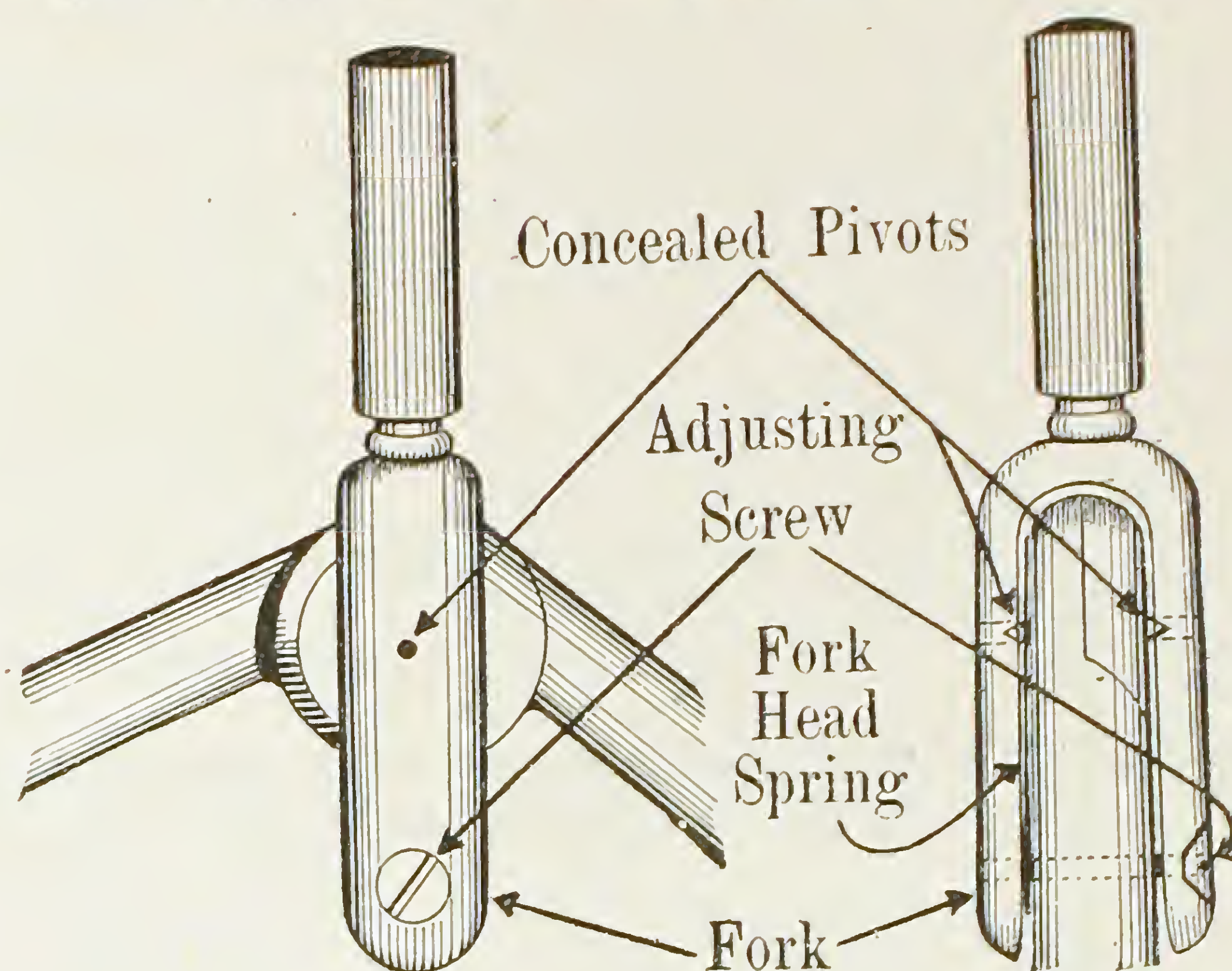


The cylindrical shape of the **Minusa** Compasses and Dividers most readily conforms to the hand, so that those who work continuously with drawing instru-



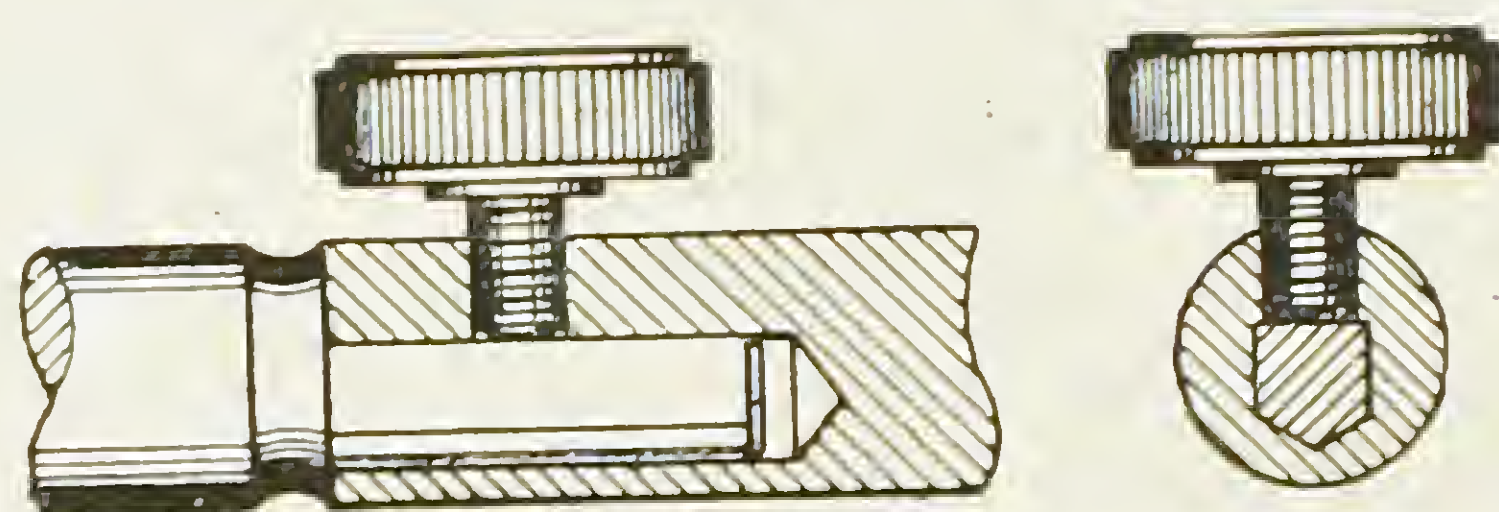
ments during long periods find that they can use this type of instrument with the least effort. These instruments are light but extremely rigid; graceful in appearance; and well balanced. The nickel silver employed in their construction is of the finest quality, having a high degree of density and hardness. Their grained finish is in sharp contrast to the glossy, cheap appearance produced by the buffing wheel on low-priced inferior instruments. The beauty of the design is shown in the illustration, but the superior finish, the excellency of the details, and the perfect balance of the instrument can only be appreciated through actual observation and handling.

The Head. The head of the compasses is of the concealed pivot joint



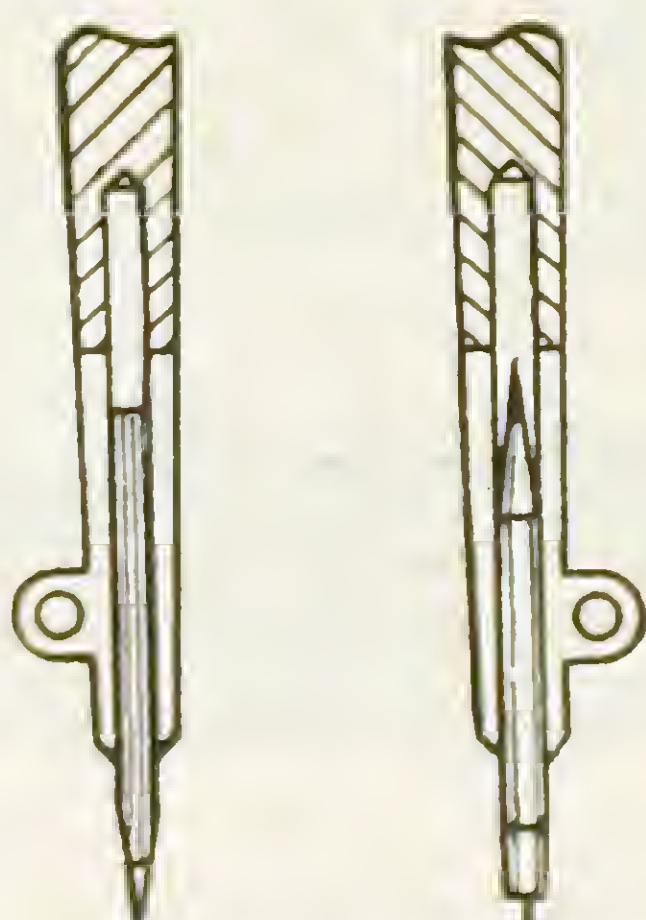
type; in which the adjustment is easily made without direct action upon the pivots. This is a strong, rigid and easily regulated joint.

Insertion Pieces. We have adhered to the pentagonal shank and socket of our famous Paragon instruments (see page 9).



The pentagonal shank engages in a socket of the same shape, being held in place by a set screw which presses the bevelled portion of the shank into the corresponding groove of the socket. This construction, besides ensuring a correct alignment when the parts are inserted, enhances the appearance of the instrument by giving the leg an unbroken line. Owing to the exactness of our manufacturing processes, the **joints are all interchangeable**, so that should any part be lost, it **can be replaced without recourse to factory fitting**.

The Clamps. Another important feature is the method of clamping the lead and needle point. This construction is the same as that in our famous Paragon instruments.

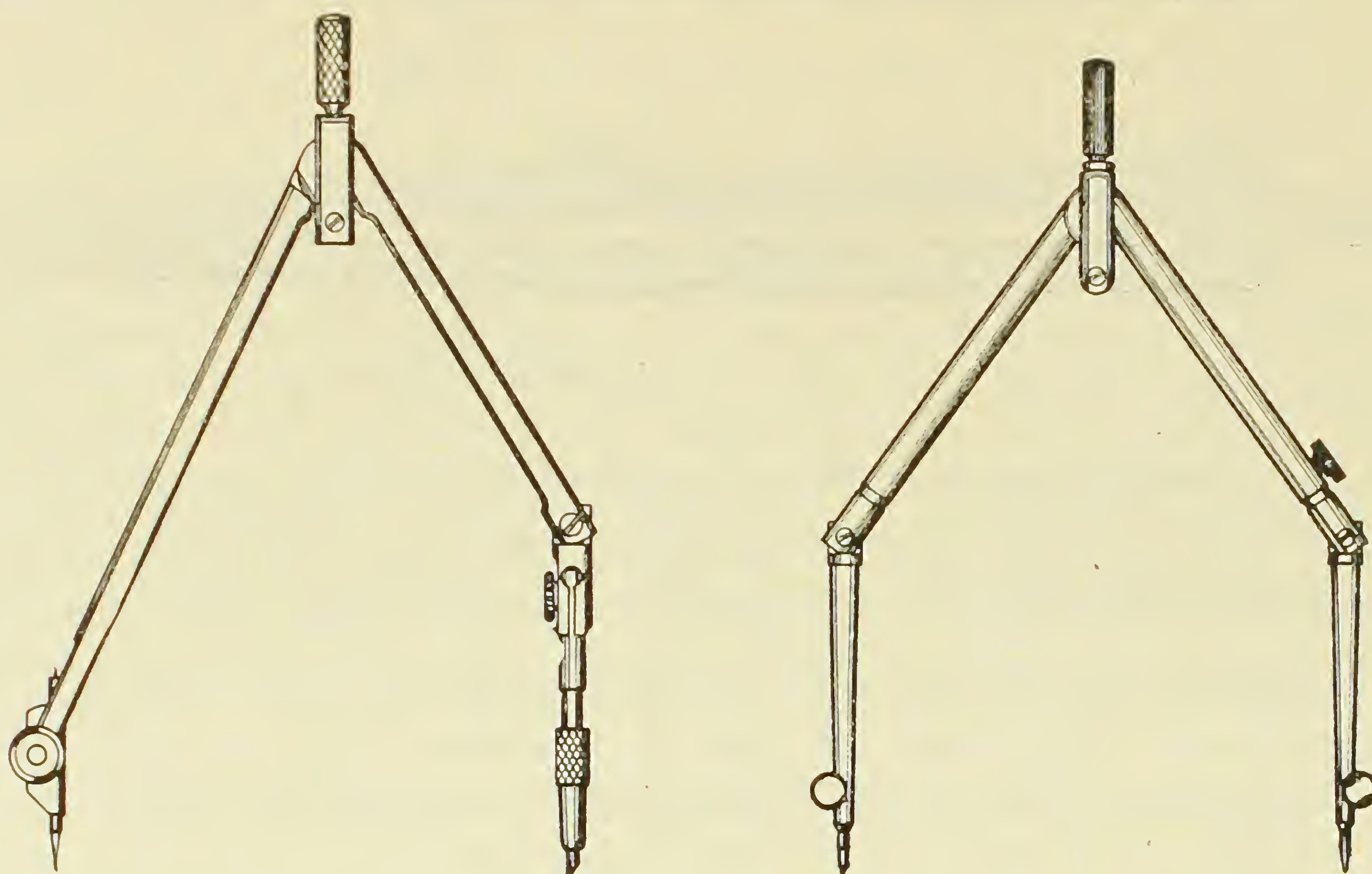


The above illustration shows this well designed construction which, while giving a firm grip on the lead without the risk of breakage, affords an easy adjust-

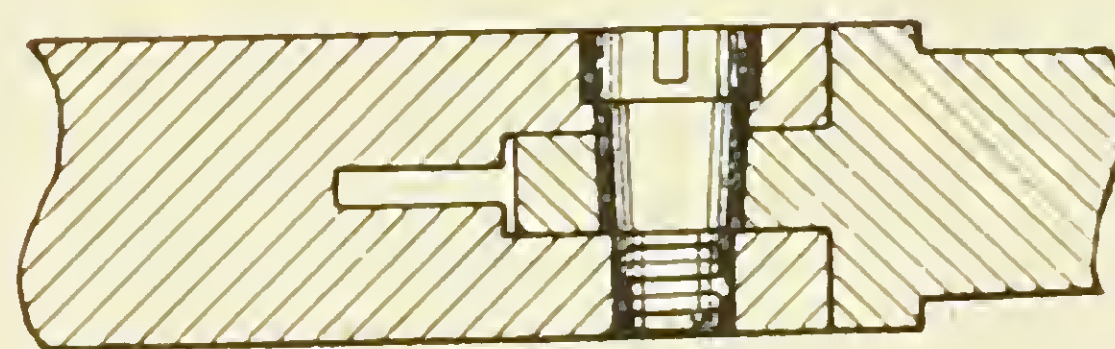
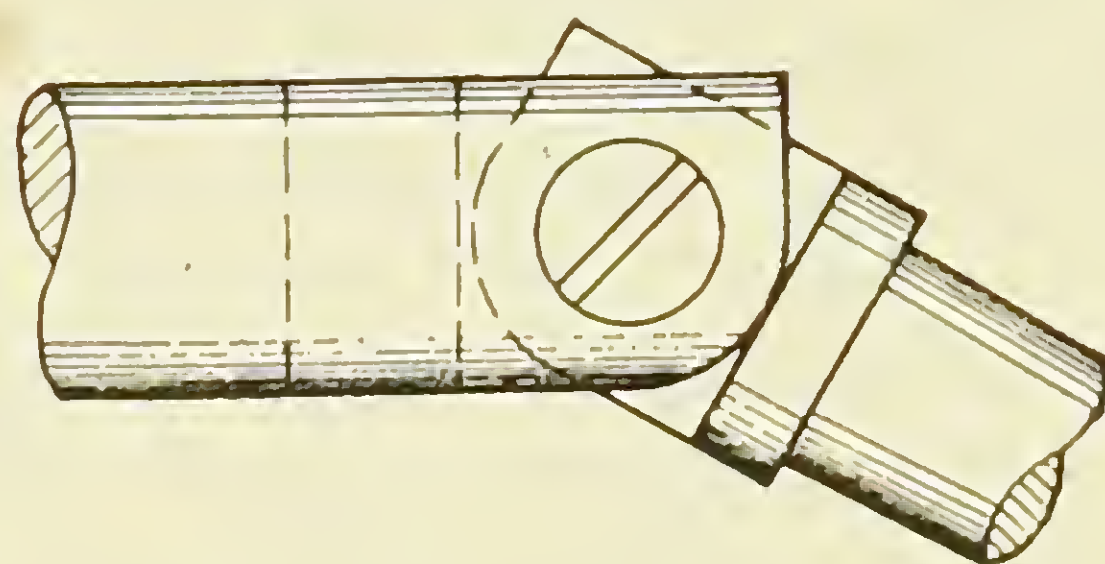


ment for setting the lead and needle point to the same length. Other forms of construction do not protect the lead so efficiently or, in designs where the contact surface is small, the lead cannot be clamped tightly enough to insure that it will not slip.

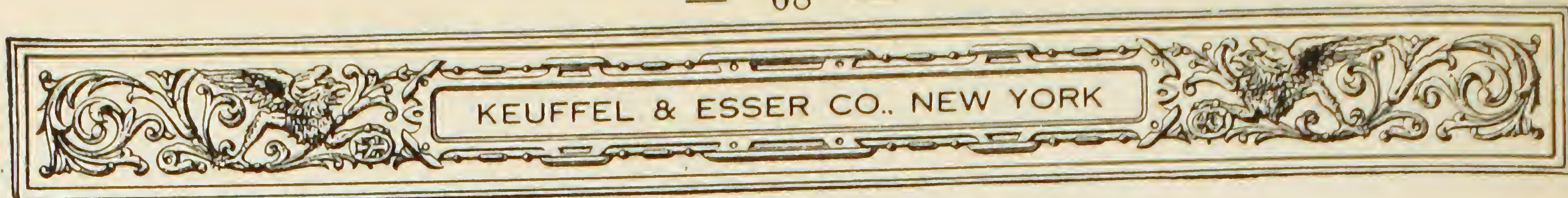
Knee Joints. The following illustrations indicate clearly the desirability of having a knee-joint in each leg. It is quite obvious that the **Minusa** type has perfect balance as well as a symmetrical appearance; whereas the cheaper type, with only one knee joint, lacks the essential balance and the accompanying symmetry of appearance.



The taper screw causes the groove of the upper leg to exert the correct pressure on the tongue of the lower leg, permitting a smooth and even movement without looseness, lost motion or undue resistance; and insuring that the legs will remain firmly in any position in which they may be set. Since the bearing faces of the tongue and groove are made absolutely parallel, the taper screw, properly set in the process of manufacture, requires no further adjustment by the user.

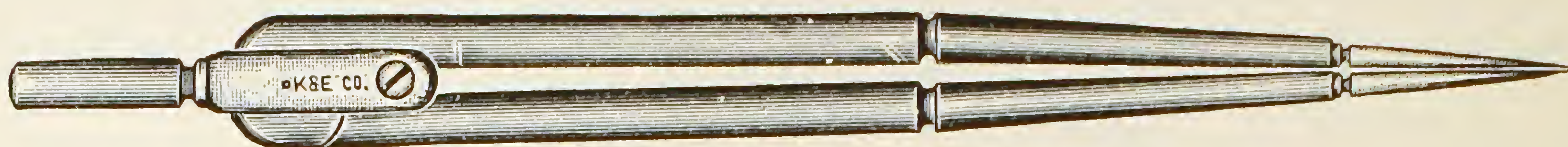


Screws and Screw Heads. Screws and screw heads, although apparently unimportant, are, in reality, vital parts of the instrument. They probably cause more trouble in inferior instruments than any other parts of the construction. Those in the **Minusa** instruments, since they are manufactured on machines of the finest precision, are the best to be found in any instruments. This statement applies to all screws and screw heads, whether on compasses, dividers, bows or drawing pens.



MINUSA DIVIDERS.

The dividers are made with the same care in regard to workmanship, and are of the same high-grade nickel silver as the compasses. The tapering legs add to the perfect balance and neat appearance of these instruments.



Plain



Hairspring

The plain divider, shown above, requires no further explanation. In the hairspring divider a slow motion arrangement provided on one leg of the divider enables the instrument to be readily set to the most exact spacing.

The needle points are made of the best grade of steel, carefully hardened and tempered, and rigidly set into the legs without the use of clamp screws; hence, in setting the divider, there is nothing to obstruct the view.

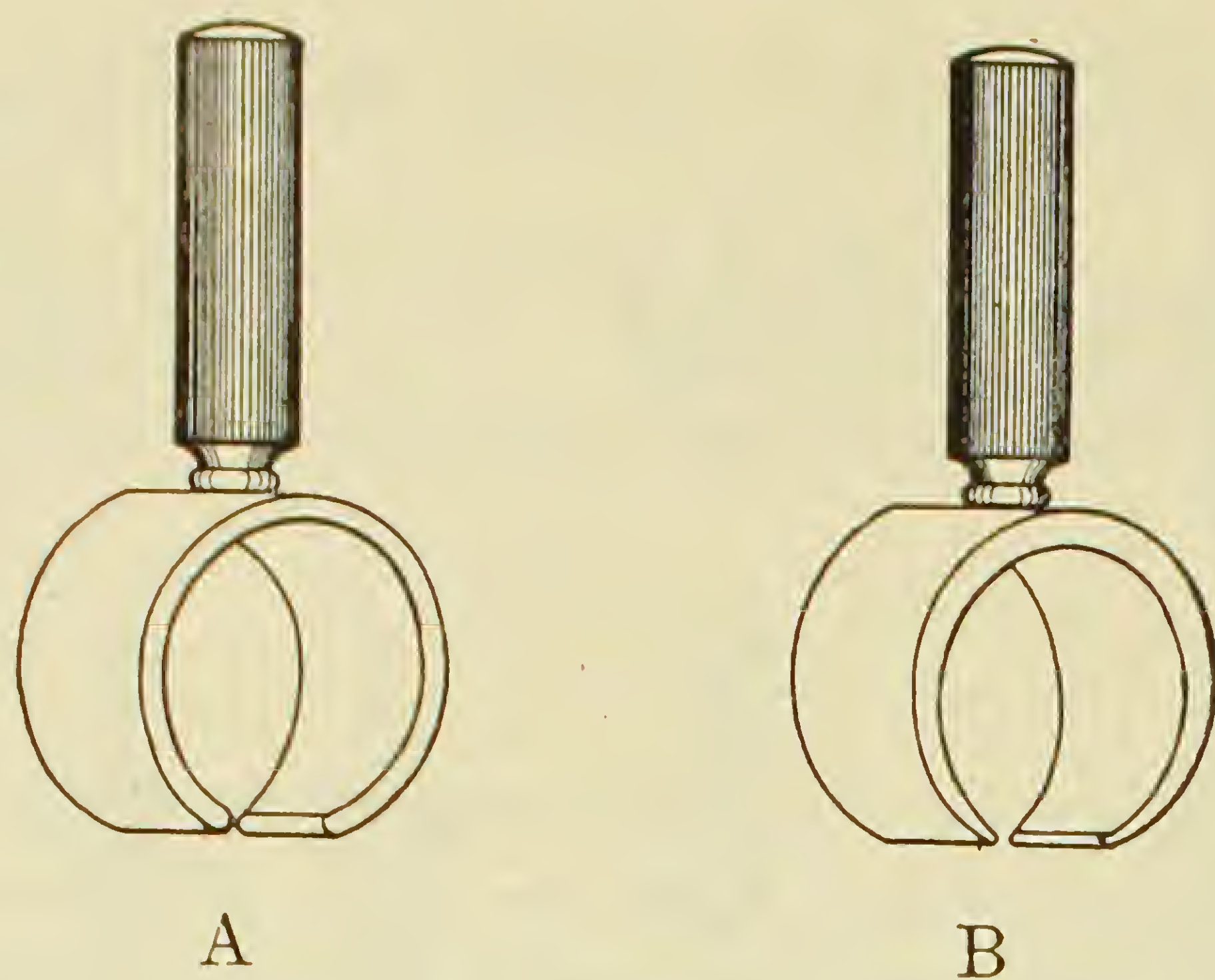
MINUSA AND MINUSA *Special*

STEEL SPRING BOWS.

(with nickel silver legs)

The Paragon type of bow instrument does not lend itself readily to the requirements of machine production; hence, in order to obtain machine-made bows of high quality at the lowest possible cost, a change in design was essential. This does not mean inferior instruments, except where the cheapening in cost of production below the minimum necessary to high-class work has led to a very considerable inferiority. For that reason our **Minusa** and **Minusa Special** Bows should not be confused with those of other makes, since the others in nowise compare with those of our **Minusa** lines. The **Minusa** Bows are light, rigid and workmanlike instruments, capable of satisfactorily filling the requirements of the most exacting draftsman.

The Spring. It is important in any type of bow instrument to have a practically uniform spring action throughout the entire range (spread) of the legs of the instrument. In the all-steel type, exemplified in our Paragon and Anchor grades, the upper half of each leg constitutes a long spring in itself, and smooth action is thus readily obtained; whereas, with the steel spring head, in which a small round spring of uniform thickness (Cut A) takes all of the action upon itself, the force exercised by the spring upon the legs is naturally much greater when the spring is under a strain than when it is relaxed. Furthermore, with a spring of this kind, if an even pressure be applied at each end by pressing the legs together, the strain is not taken up throughout the spring, but is concentrated at the center where the handle is attached. This inferior type of steel spring is that most used with inferior grades of instruments.



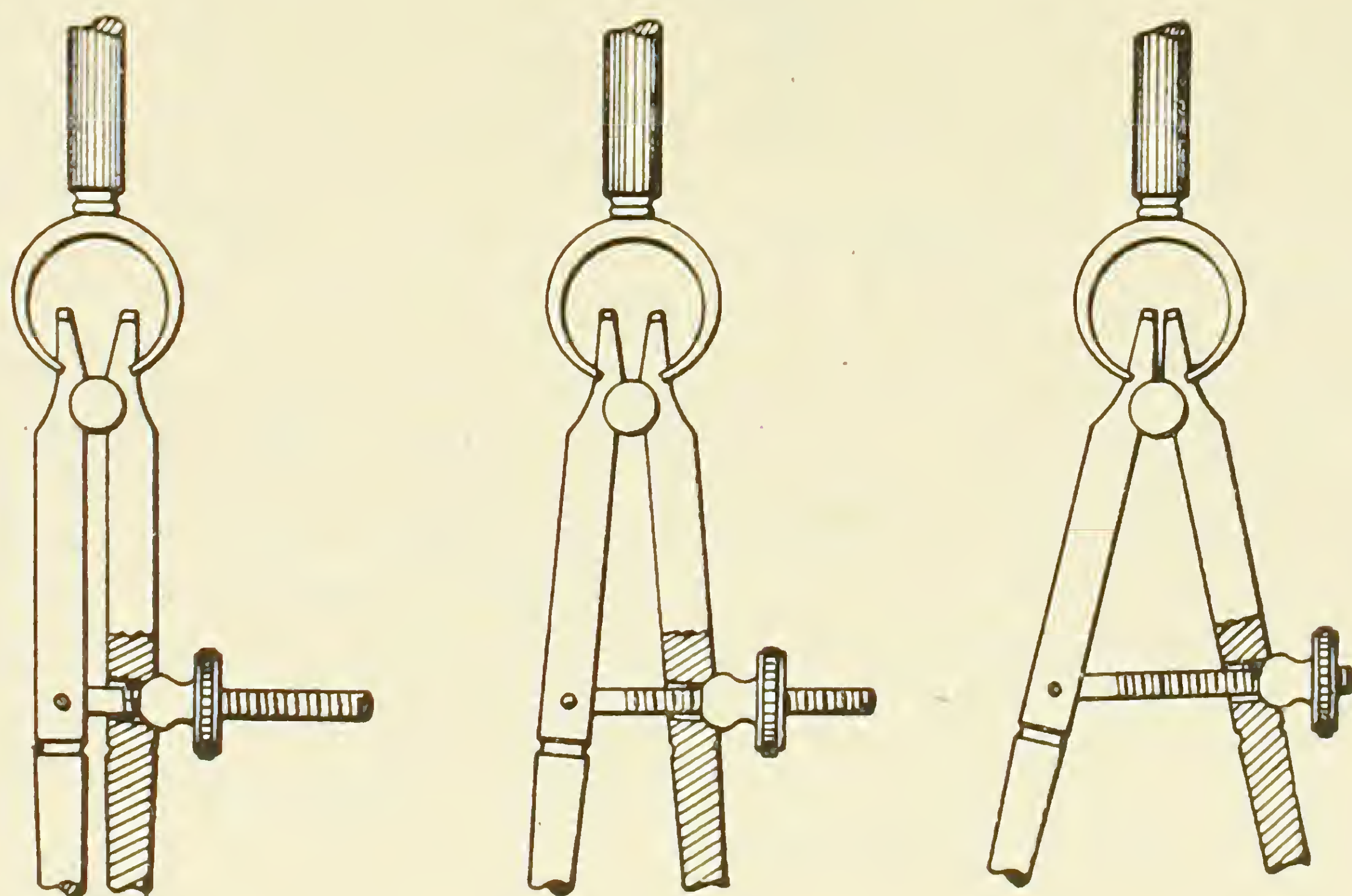
The springs of the **Minusa** Bows are constructed as follows:

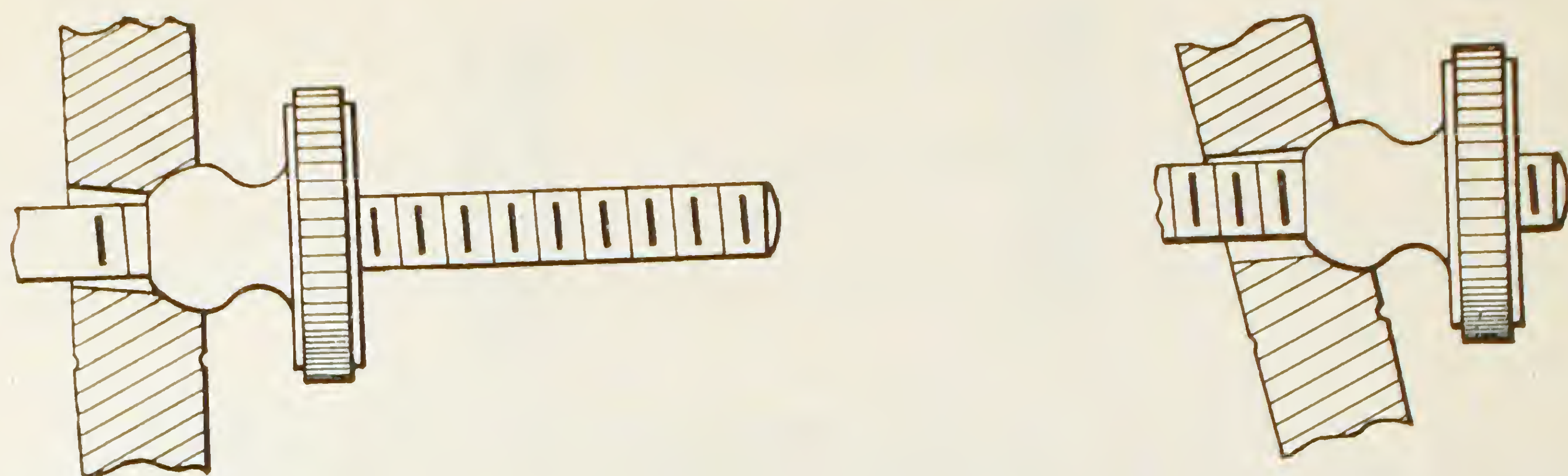
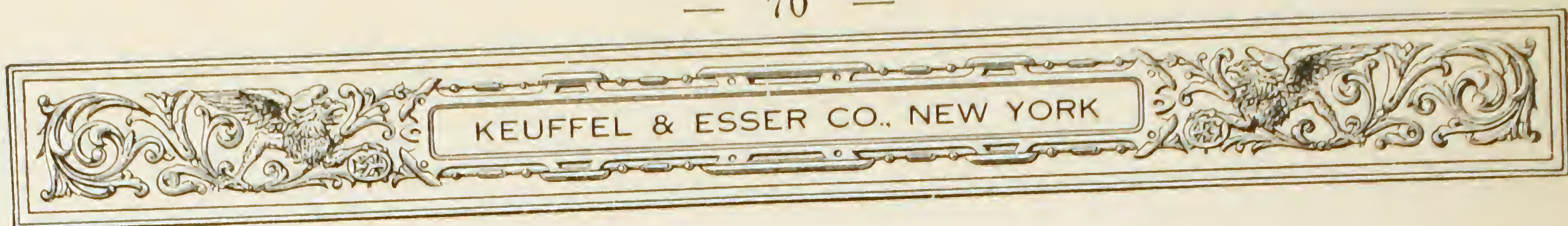
In order to attain a uniform tension with the legs in any position, a taper in the thickness of the spring from the center toward both ends (Cut B) is provided. This arrangement exemplifies the well-known principle of the cantilever spring, the cross-section (both width and thickness) of which diminishes on a parabolic curve towards the ends where the pressure is applied. Hence, as the spring action is equally strong at every point, every portion of the spring head takes up the strain, and a uniform pressure is exerted on the legs throughout their range of movement. A smooth even motion of the adjusting screw is thus ensured; and uneven stresses, resulting in rapid deterioration of the spring, avoided.

Unless a spring of this type is correctly designed and perfectly made, it is no better than the inferior type exemplified by cut A above. Hence, in order to secure perfection in manufacture, we have gone to considerable expense for the development of efficient methods. As a result we have a spring which will satisfy any draftsman; and which, we feel assured, is not duplicated in any instrument of similar construction.

Adjusting Screws. The well known principle of the ball and socket is used where the adjusting screw nut is in contact with the leg of the bow instrument; the leg itself being countersunk to act as a socket for the ball face of the adjusting screw nut.

The construction of the ball-and-socket joint is shown in the following illustrations.





Attention is called to the fact that the threads of the adjusting screw cannot rub against the sides of the clearance hole. This is one of those seemingly unimportant details, which, however, mean a great deal, since, in this case, it insures that the thread of the screw will not be damaged.

Clamps. The needle clamp and nut of both the bow-pen and pencil are attached in such a manner that they cannot accidentally become separated from the leg. This construction obviates a frequent objection to the use of the ordinary type of bow instrument.

The needle points of the bow divider are fastened directly into the legs (movable points are unnecessary on a divider), so that no nuts are present to obstruct the view in making precise settings.

Center Thumb Nut. Bow instruments with the center thumb nut are also regularly supplied (page 74). The advantages of this type of instrument are described on page 13.

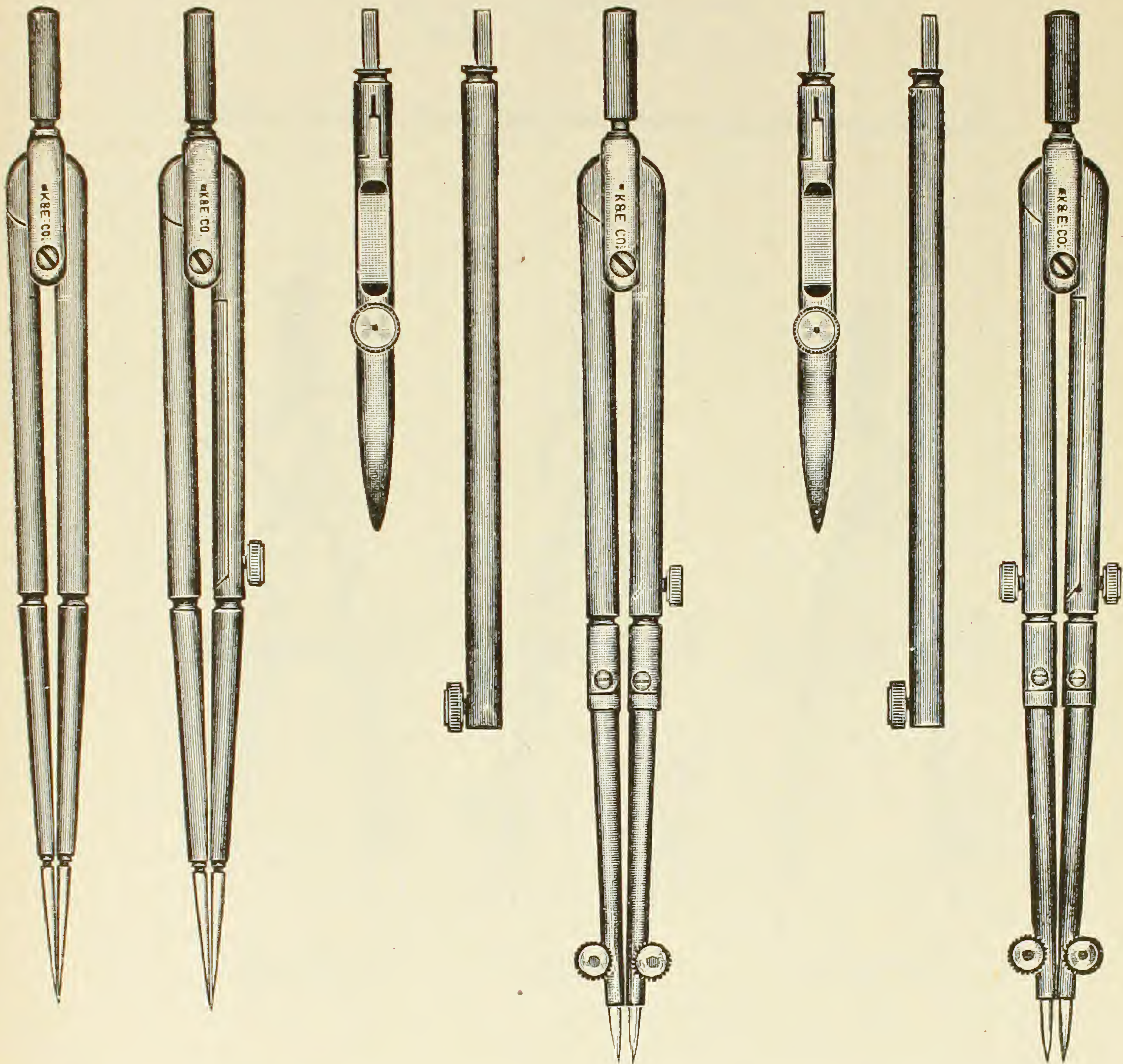


MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

Each instrument stamped "Minusa" and K & E Co.



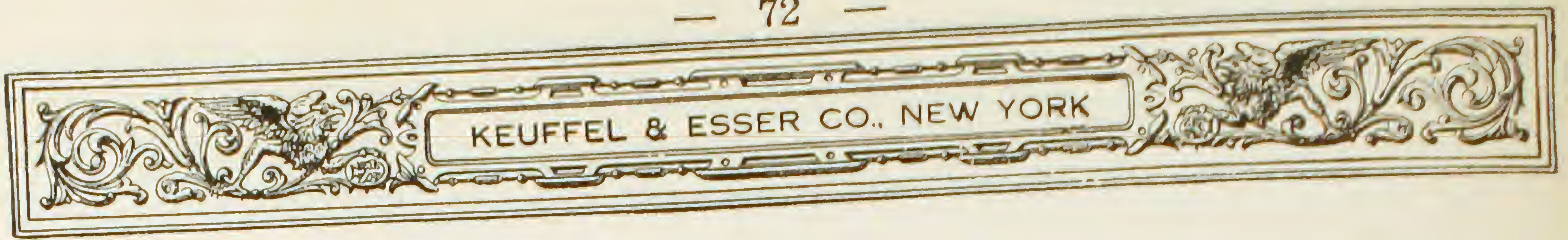
No. N 746.

N 748.

N 750.

N 751.

- | | | |
|---------|--|---------|
| N 746. | Plain Divider, 5½ in..... | each \$ |
| N 748. | Hairspring Divider, 5½ in..... | " |
| N 750. | Compasses, 6½ in., with fixed Needle Point, Pen, Pencil Point, and Lengthening Bar..... | " |
| N 751. | Compasses, 6½ in., with fixed Needle Point, with Hairspring, Pen, Pencil Point, and Lengthening Bar..... | " |
| N 759. | Lead Box, containing 3 Leads..... | " |
| N 759½. | " " " " " furnished with sets N 790 to N 797 inc. | " |

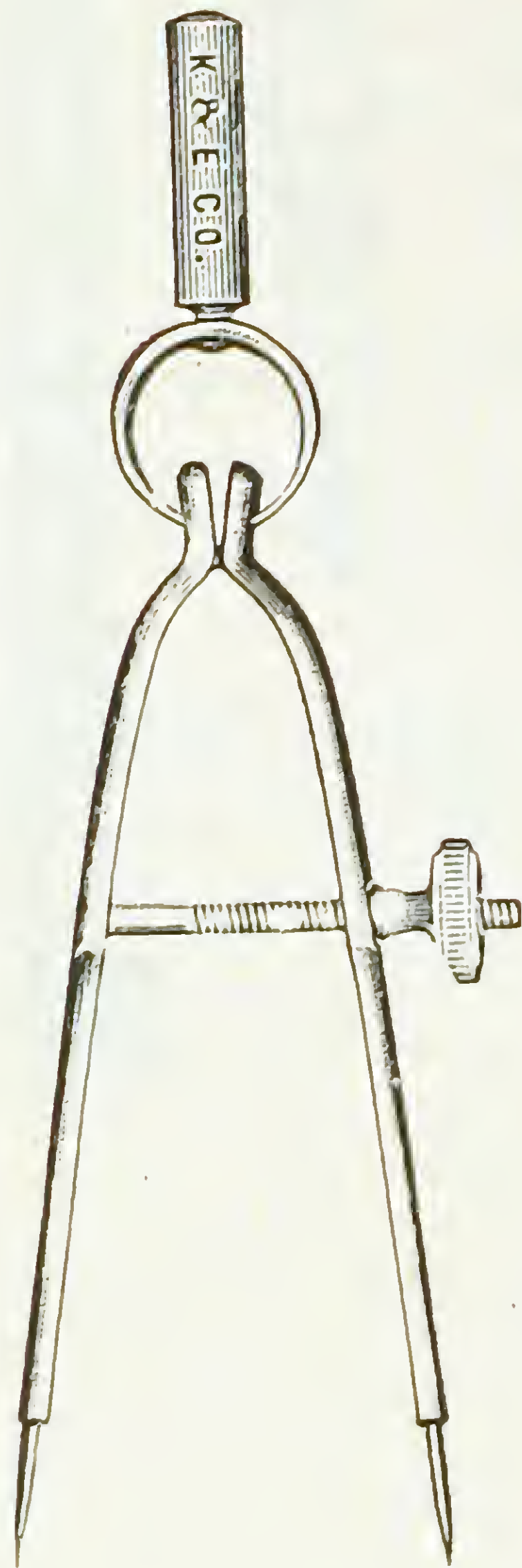


MINUSA DRAWING INSTRUMENTS.

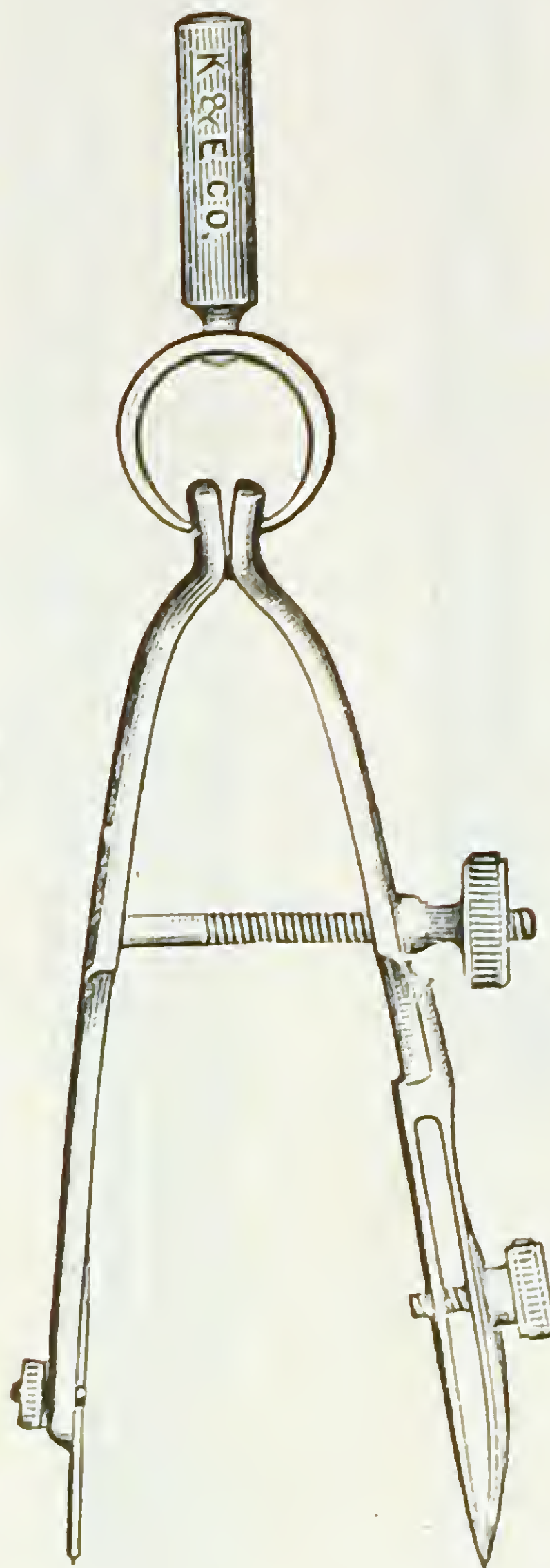
REG. U. S. PAT. OFF.

Made in the U. S. A.

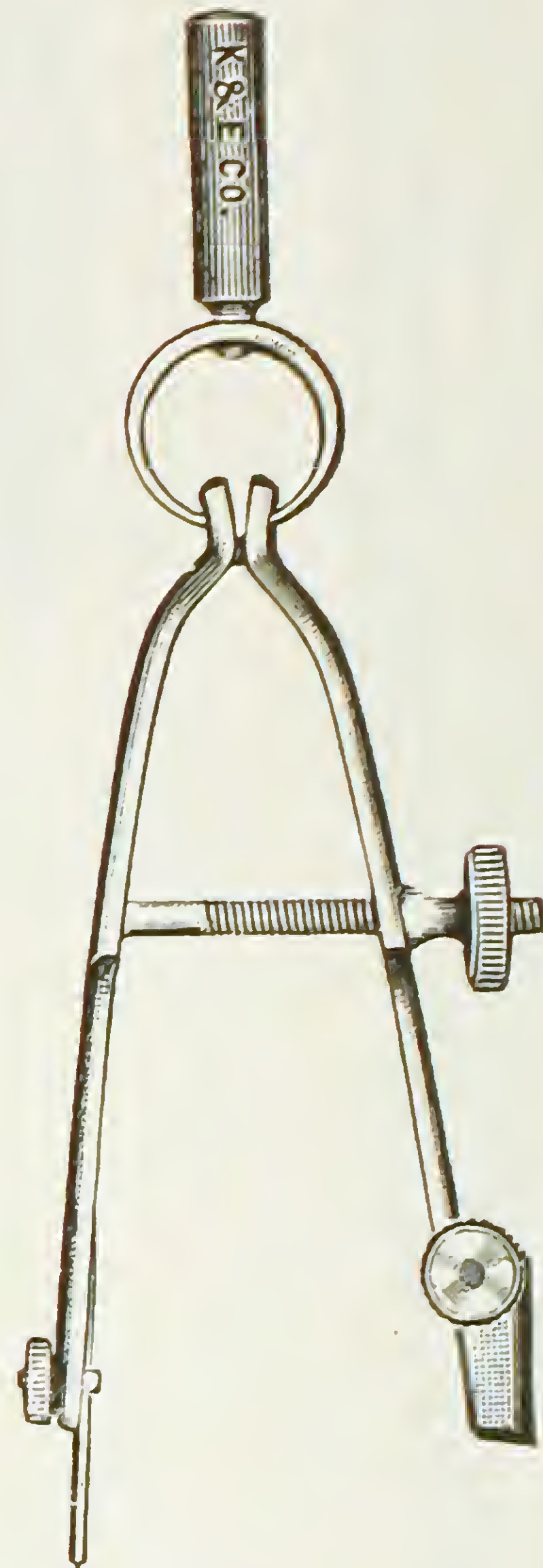
Each Instrument stamped "Minusa" and K & E CO.



No. N 760.



N 761.



N 762.

N 760. Steelspring Bow Divider, nickel silver Handle, $3\frac{1}{2}$ in. each \$

N 761. Steelspring Bow Pen, Spring Blade, with adjustable Needle Point, nickel silver Handle, $3\frac{1}{2}$ in. “

N 762. Steelspring Bow Pencil, with adjustable Needle Point, nickel silver Handle, $3\frac{1}{2}$ in. “



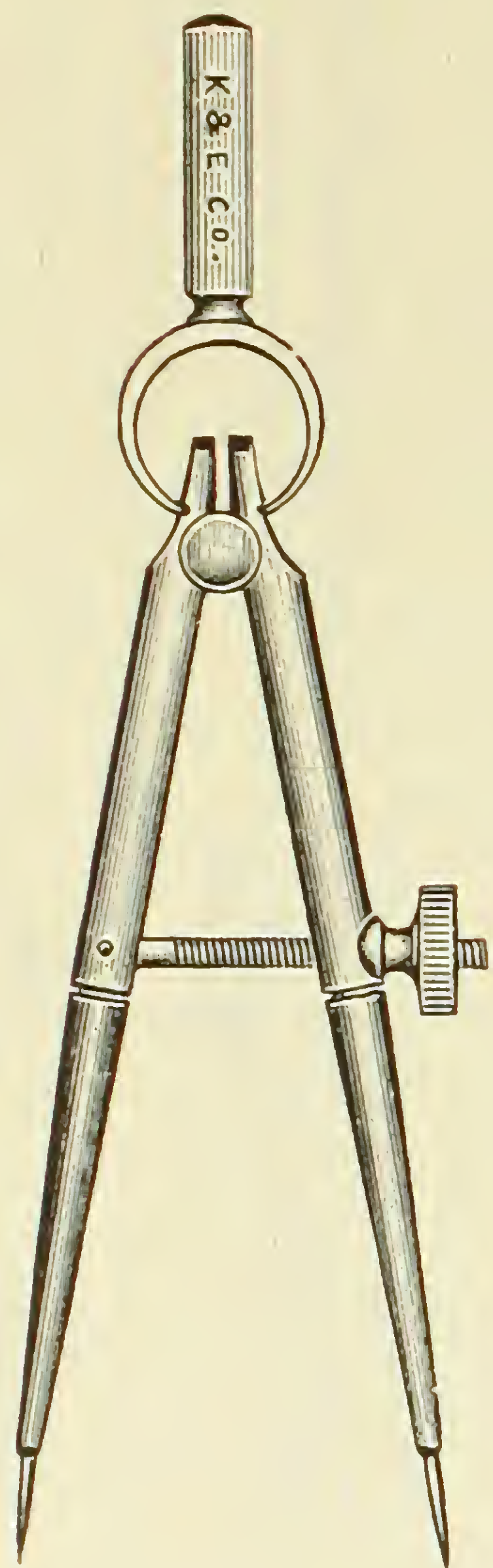
MINUSA *Special*

REG. U. S. PAT. OFF.

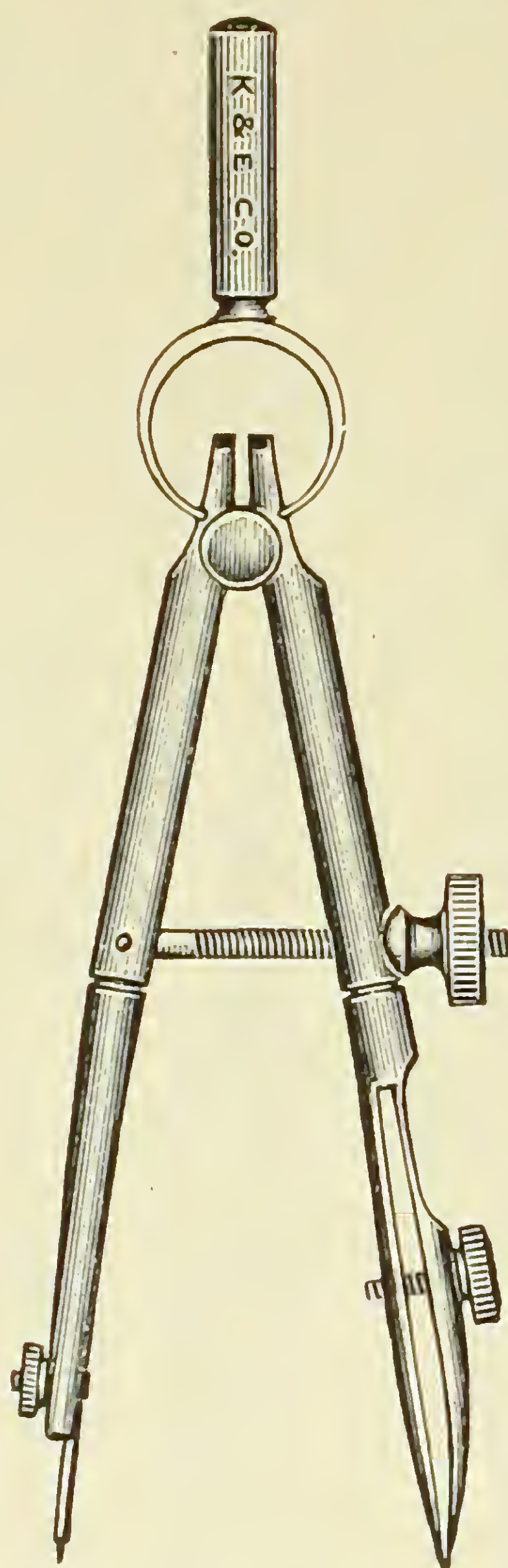
DRAWING INSTRUMENTS.

Made in the U. S. A.

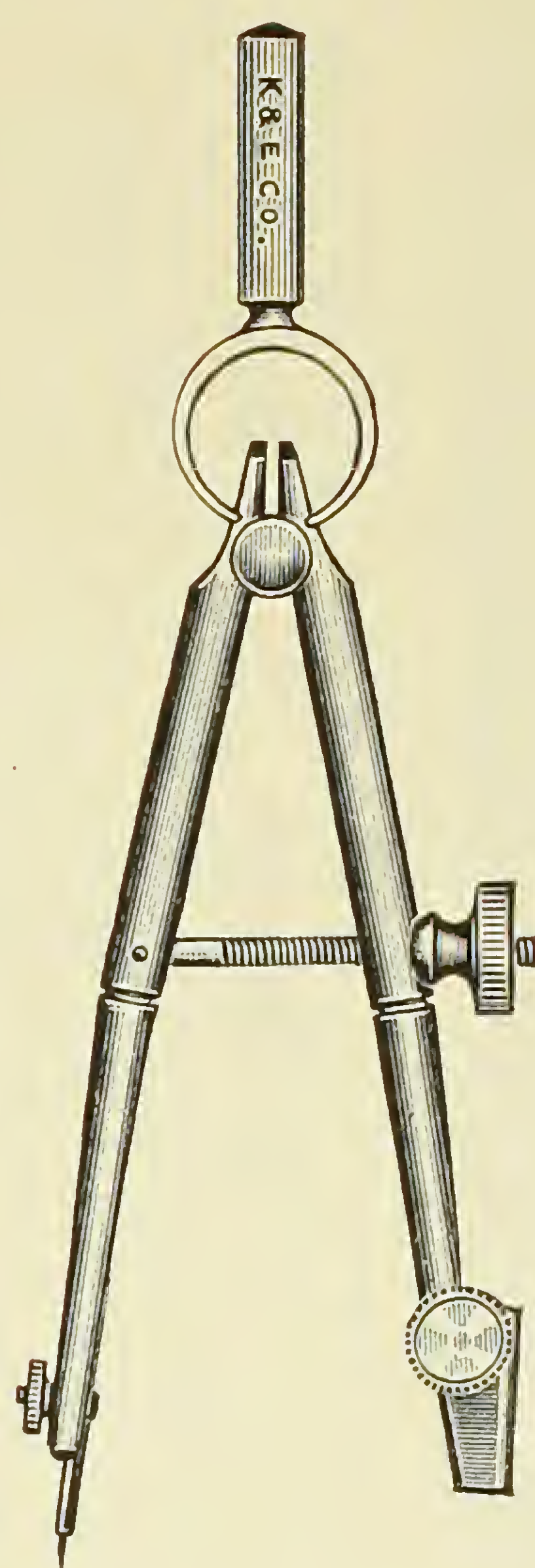
Each Instrument stamped "Minusa" and K & E CO.



No. N 760 $\frac{1}{2}$.



N 761 $\frac{1}{2}$.

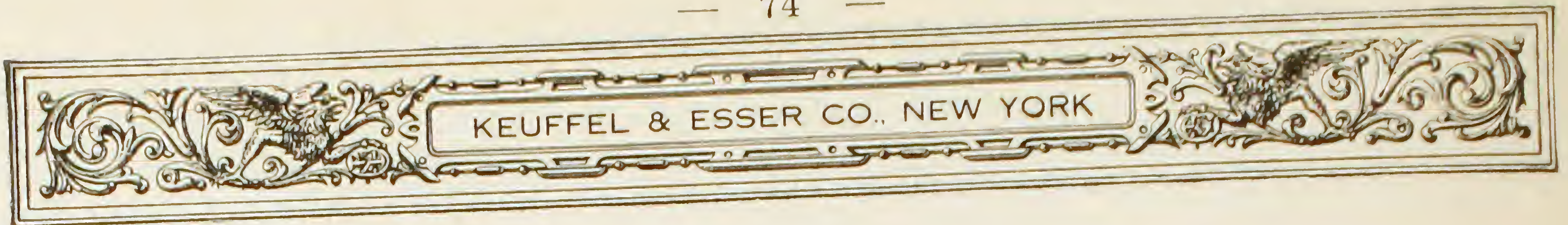


N 762 $\frac{1}{2}$.

N 760 $\frac{1}{2}$. Steelspring Bow Divider, nickel silver handle, 3 $\frac{1}{2}$ in. each \$

N 761 $\frac{1}{2}$. Steelspring Bow Pen, Spring Blade, with adjustable Needle
Point, nickel silver Handle, 3 $\frac{1}{2}$ in. “

N 762 $\frac{1}{2}$. Steelspring Bow Pencil, with adjustable Needle Point,
nickel silver Handle, 3 $\frac{1}{2}$ in. “



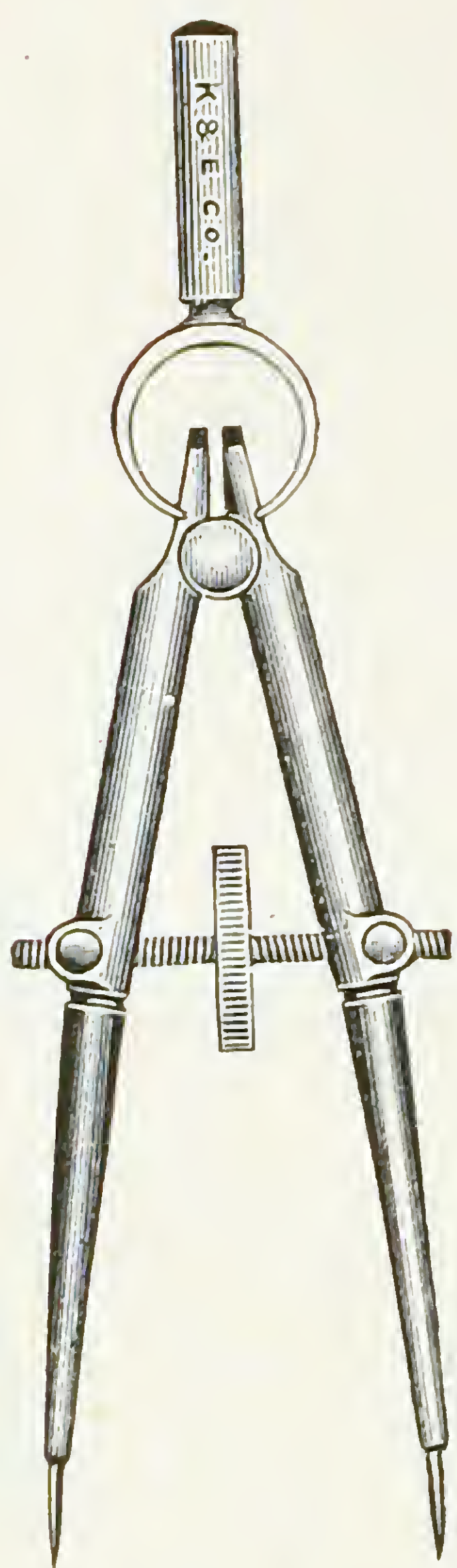
MINUSA *Special*

REG. U. S. PAT. OFF.

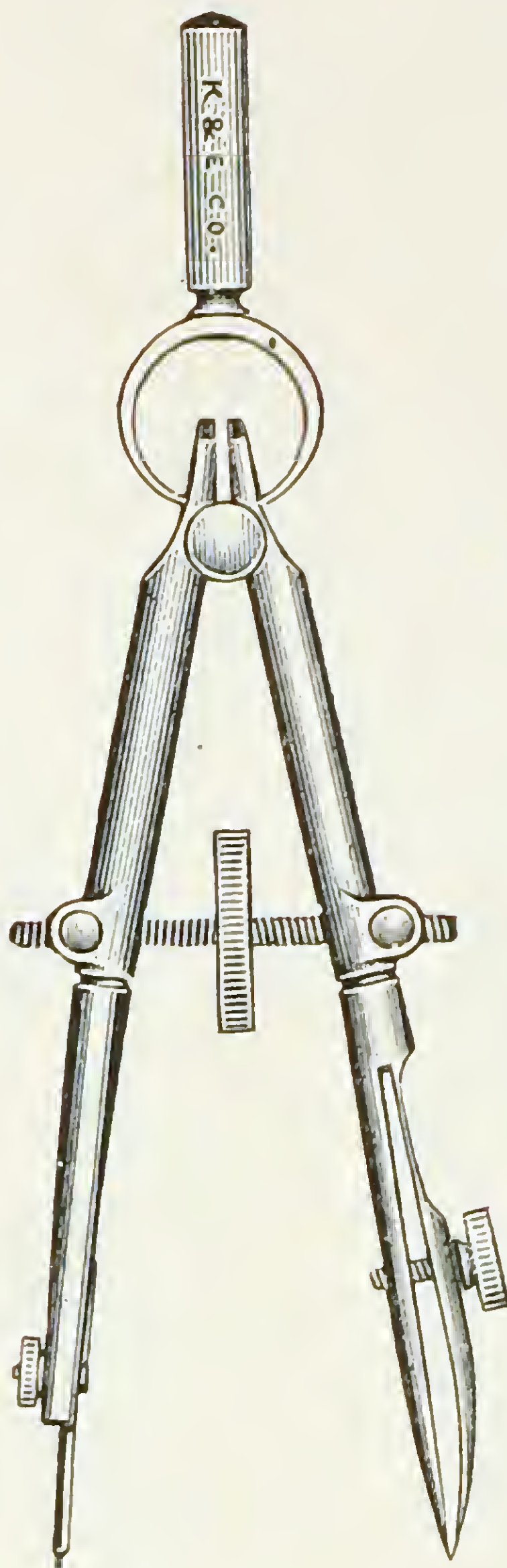
DRAWING INSTRUMENTS.

Made in the U. S. A.

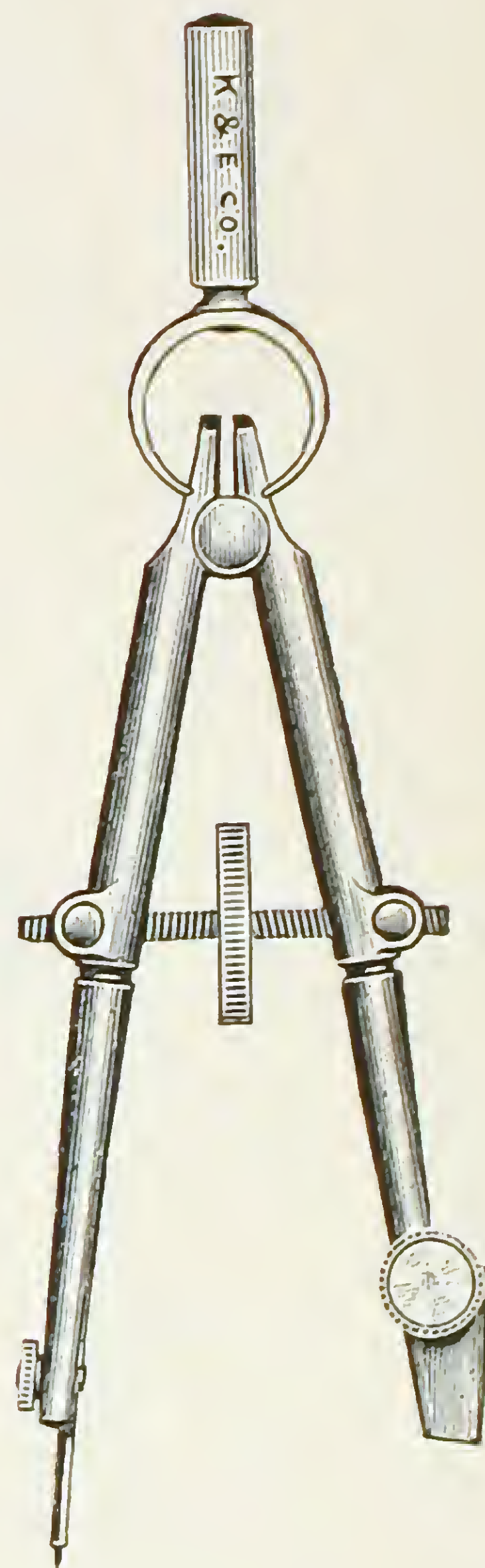
Each Instrument stamped "Minusa" and K & E CO.



No. N 765 $\frac{1}{2}$.



N 766 $\frac{1}{2}$.



N 767 $\frac{1}{2}$.

N 765 $\frac{1}{2}$. Steelspring Bow Divider, with central thumbnut, nickel silver Handle, 3 $\frac{1}{2}$ in.....each \$

N 766 $\frac{1}{2}$. Steelspring Bow Pen, with central thumbnut, with adjustable Needle Point, nickel silver Handle, 3 $\frac{1}{2}$ in..... “

N 767 $\frac{1}{2}$. Steelspring Bow Pencil, with central thumbnut, with adjustable Needle Point, nickel silver Handle, 3 $\frac{1}{2}$ in.... “



MINUSA DRAWING INSTRUMENTS.

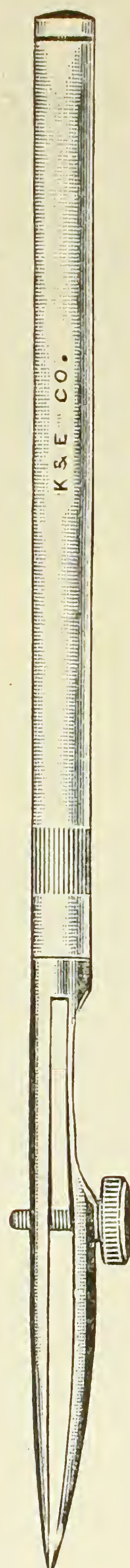
REG. U. S. PAT. OFF.

Made in the U. S. A.

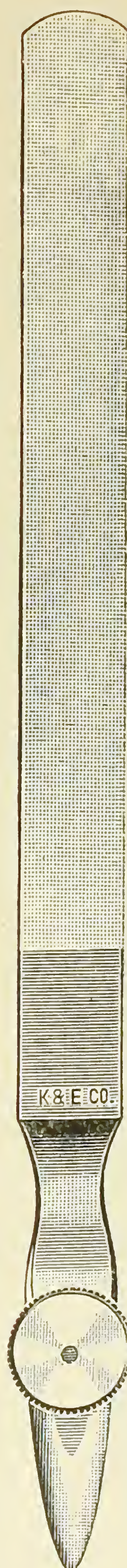
Each Instrument stamped "Minusa" and K & E CO.



No. N 772.



N 774.



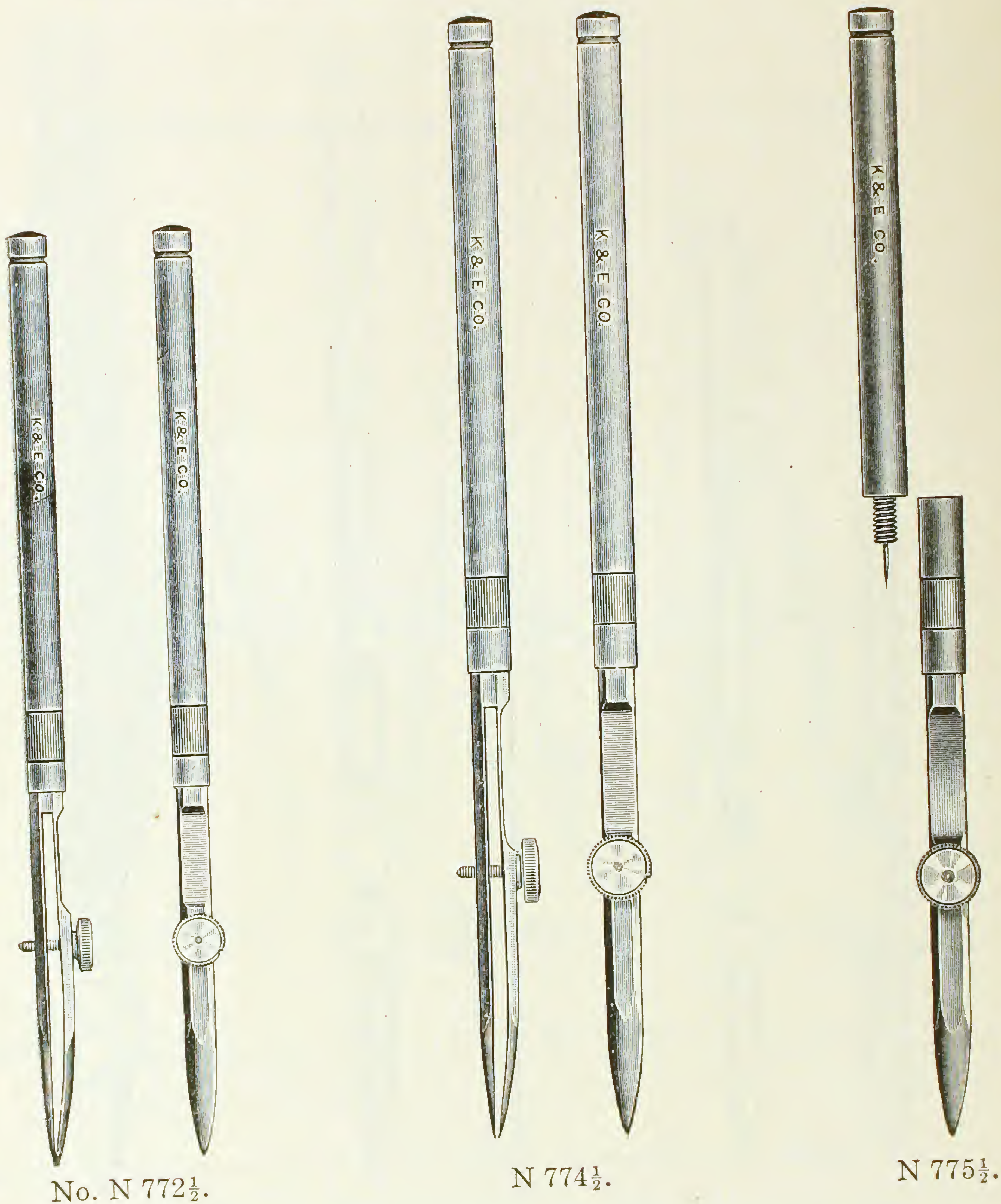
N 777.

- | | | |
|--------|--|---------|
| N 772. | Drawing Pen, upper blade with spring, $4\frac{1}{2}$ in..... | each \$ |
| N 774. | Drawing Pen, upper blade with spring, $5\frac{1}{2}$ in..... | " |
| N 777. | Detail Pen, upper blade with spring, 6 in..... | " |



MINUSA *Special*
REG. U. S. PAT. OFF.
DRAWING INSTRUMENTS.
 Made in the U. S. A.

Each Instrument stamped "Minusa" and K & E CO.



- Made from highest grade octagonal steel, finest finish.
- N 772 $\frac{1}{2}$. Drawing Pen, upper blade with spring, 4 $\frac{1}{2}$ in. each \$
- N 774 $\frac{1}{2}$. Drawing Pen, upper blade with spring, 5 $\frac{1}{2}$ in. “
- N 775 $\frac{1}{2}$. Drawing Pen, upper blade with spring, 5 $\frac{1}{2}$ in., detachable
 Handle with pricker point. “



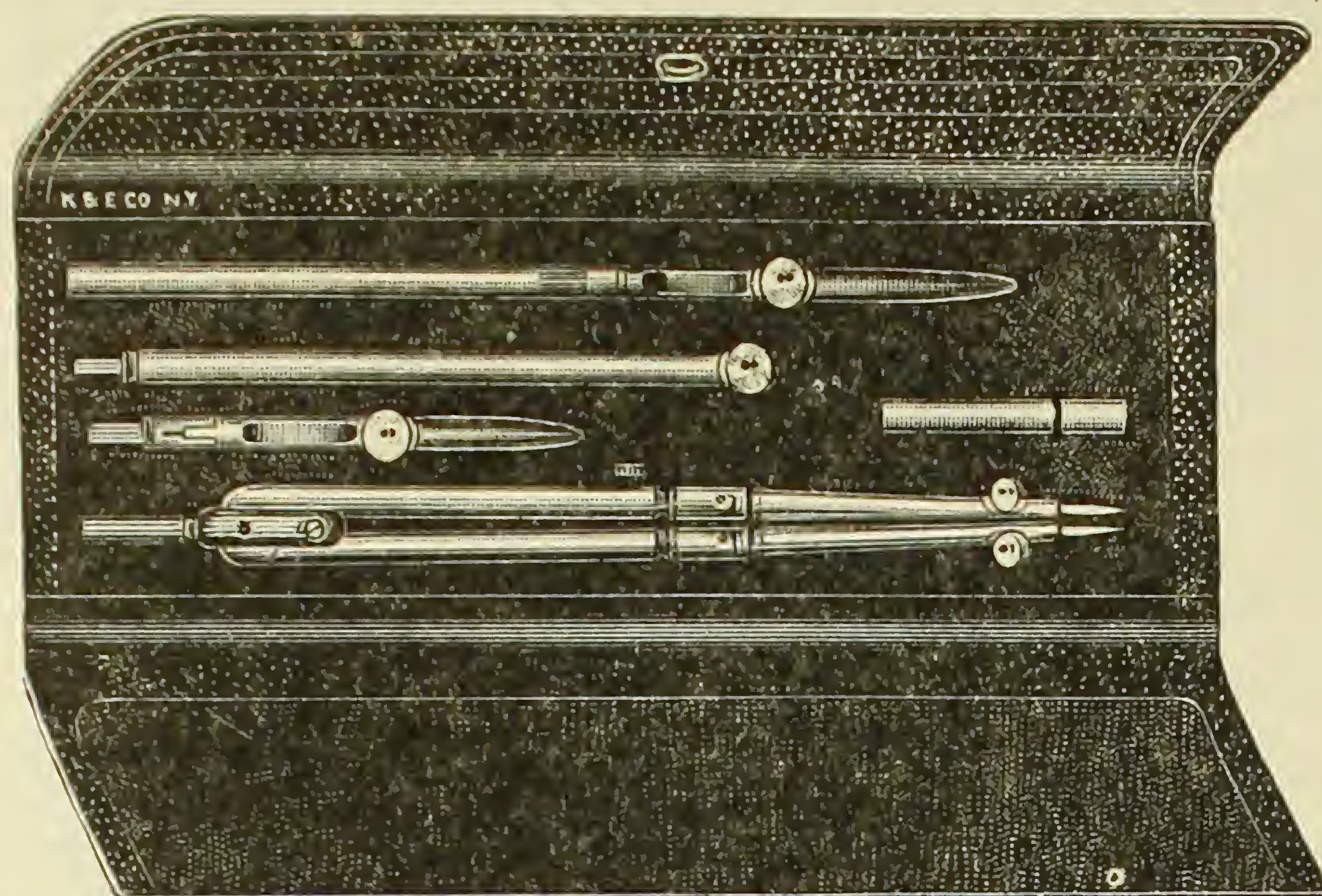
MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

Each Instrument stamped "Minusa" and K & E CO.

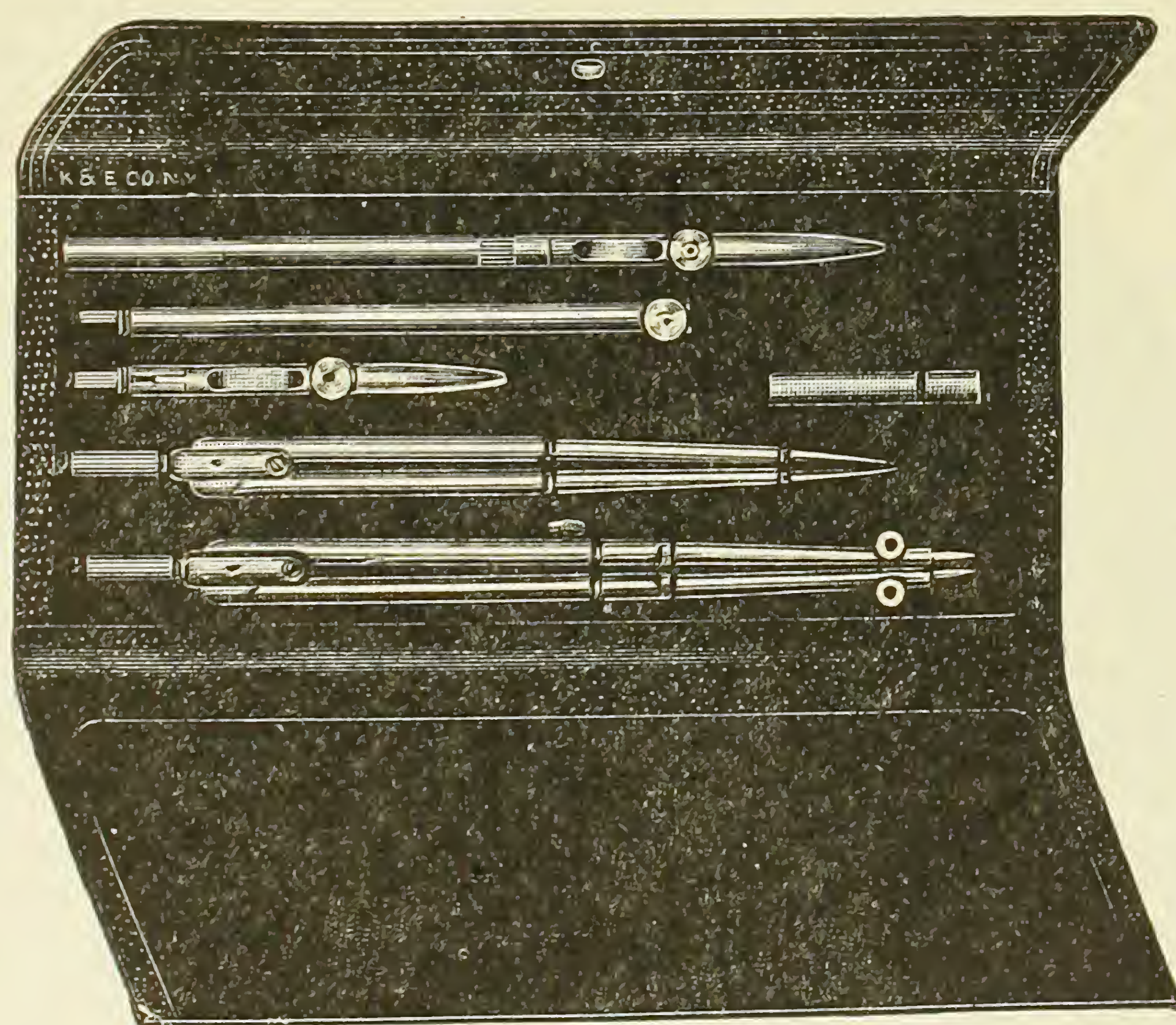
SETS ARE IN MOROCCO FINISH CASES, VELVET LINED.



No. N 780.

N 780. Pocket Case, containing:—

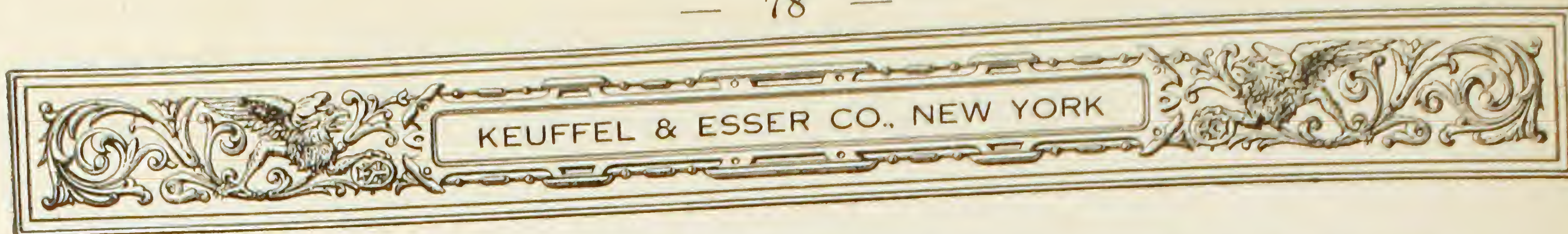
- 1 Compasses, $6\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750,
- 1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No. N 774.
- 1 Lead Box containing 3 leads, No. N 759 each, \$



No. N 782.

N 782. Pocket Case containing:—

- 1 Compasses, $6\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point, and Lengthening Bar, No. N 750,
- 1 Plain Divider, $5\frac{1}{2}$ in., No. N 746,
- 1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No. N 774,
- 1 Lead Box containing 3 leads, No. N 759 each, \$

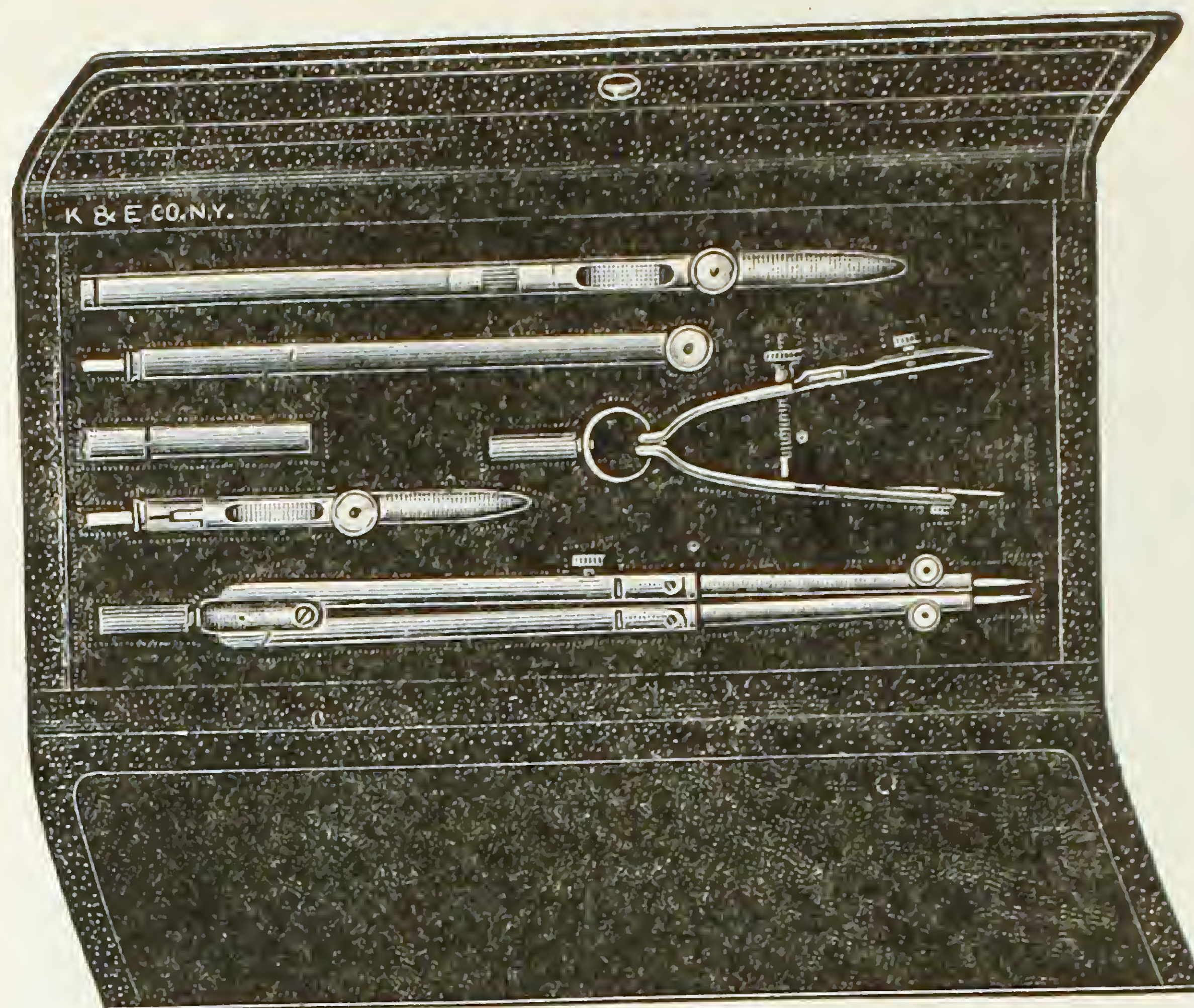


MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

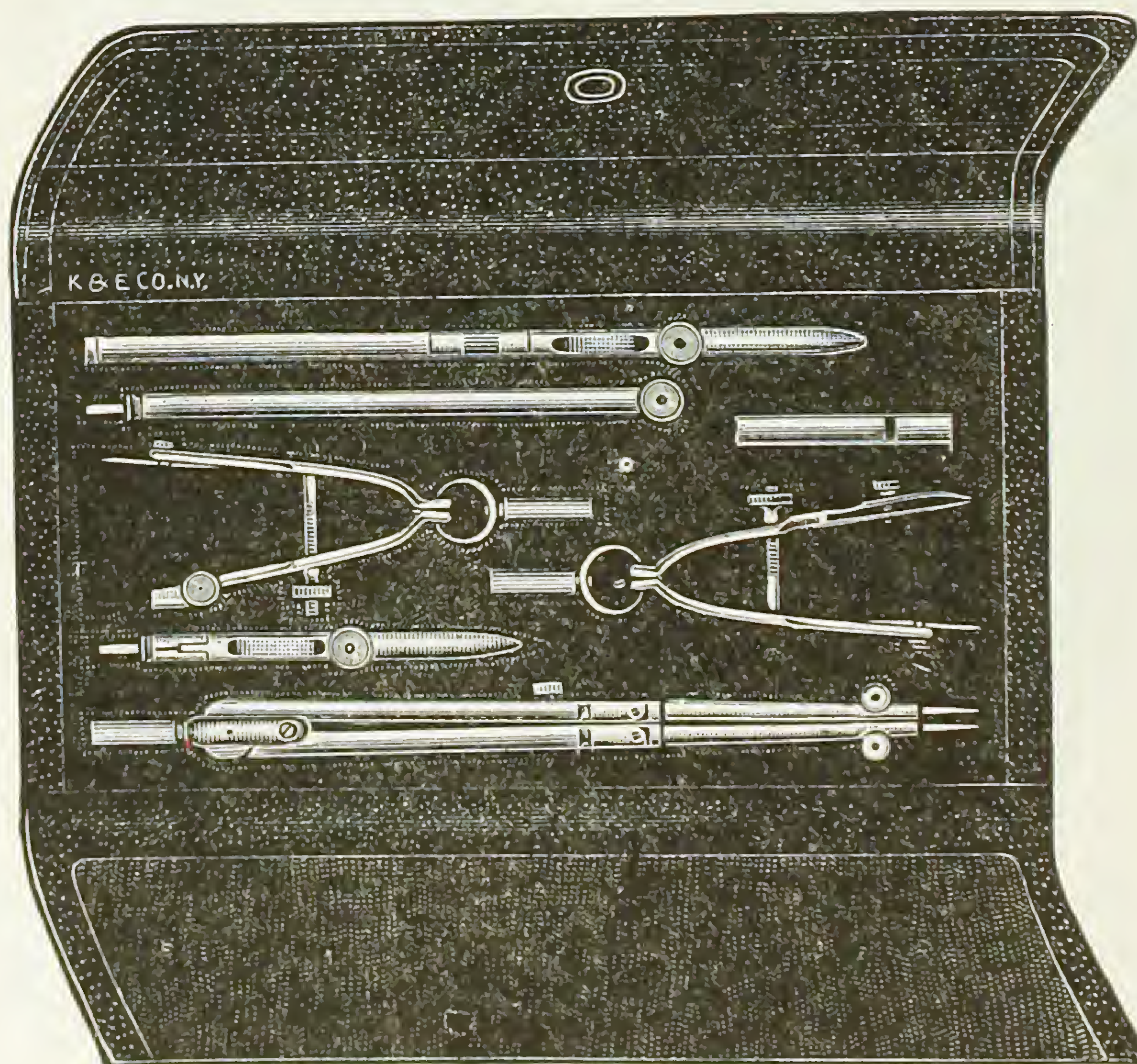
Each Instrument stamped "Minusa" and K & E CO.



No. N 783.

N 783. Pocket Case containing:—

- 1 Compasses, 6½ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750,
- 1 Drawing Pen, 5½ in., upper blade with spring, No. N 774,
- 1 Steelspring Bow Pen, 3½ in., No. N 761,
- 1 Lead Box, containing 3 leads, No. N 759.....each, \$



No. N 783½.

N 783½. Pocket Case, containing same assortment as No. N 783, but with the addition of 1 Steelspring Bow Pencil, No. N 762, each \$

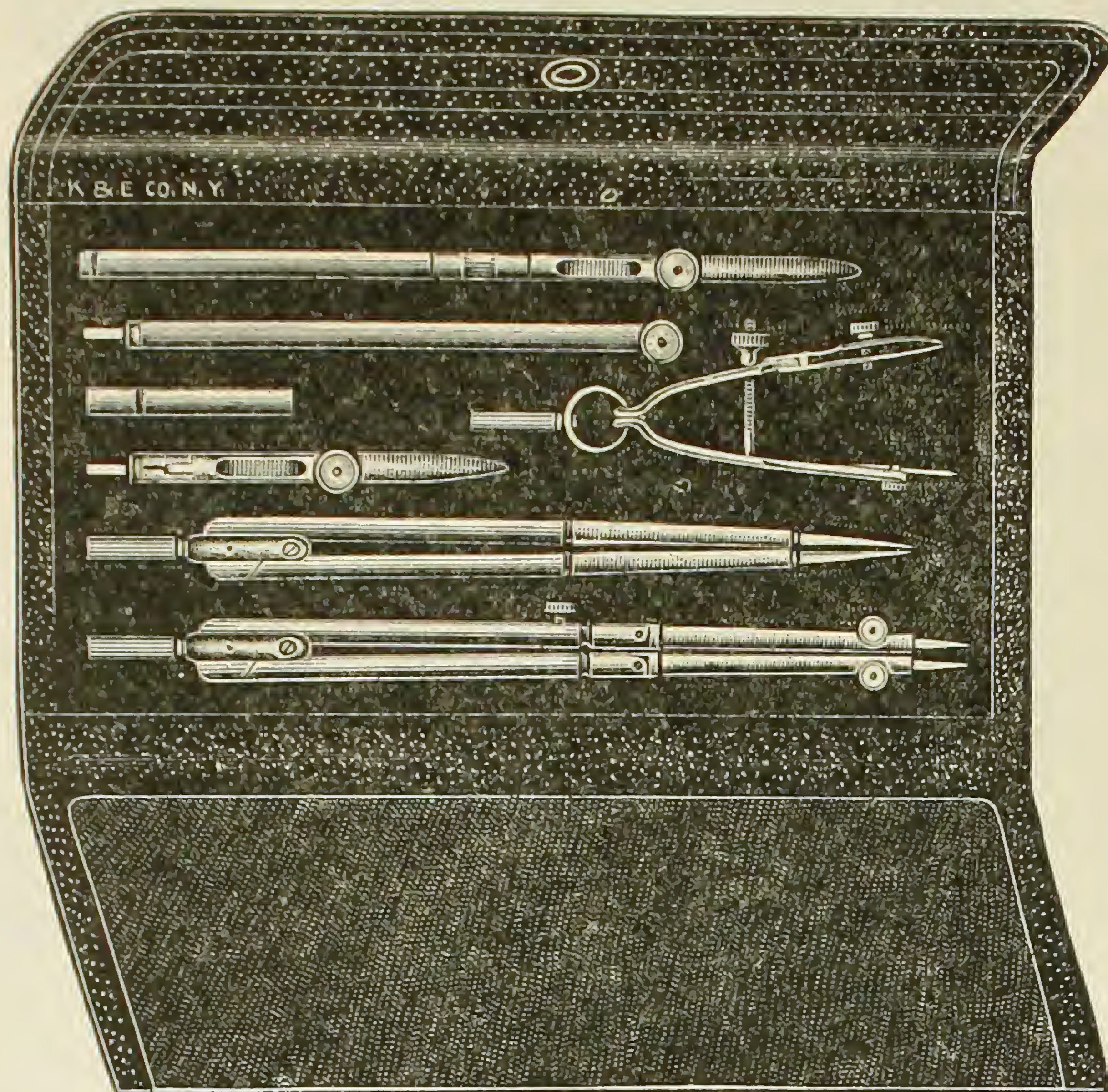


MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

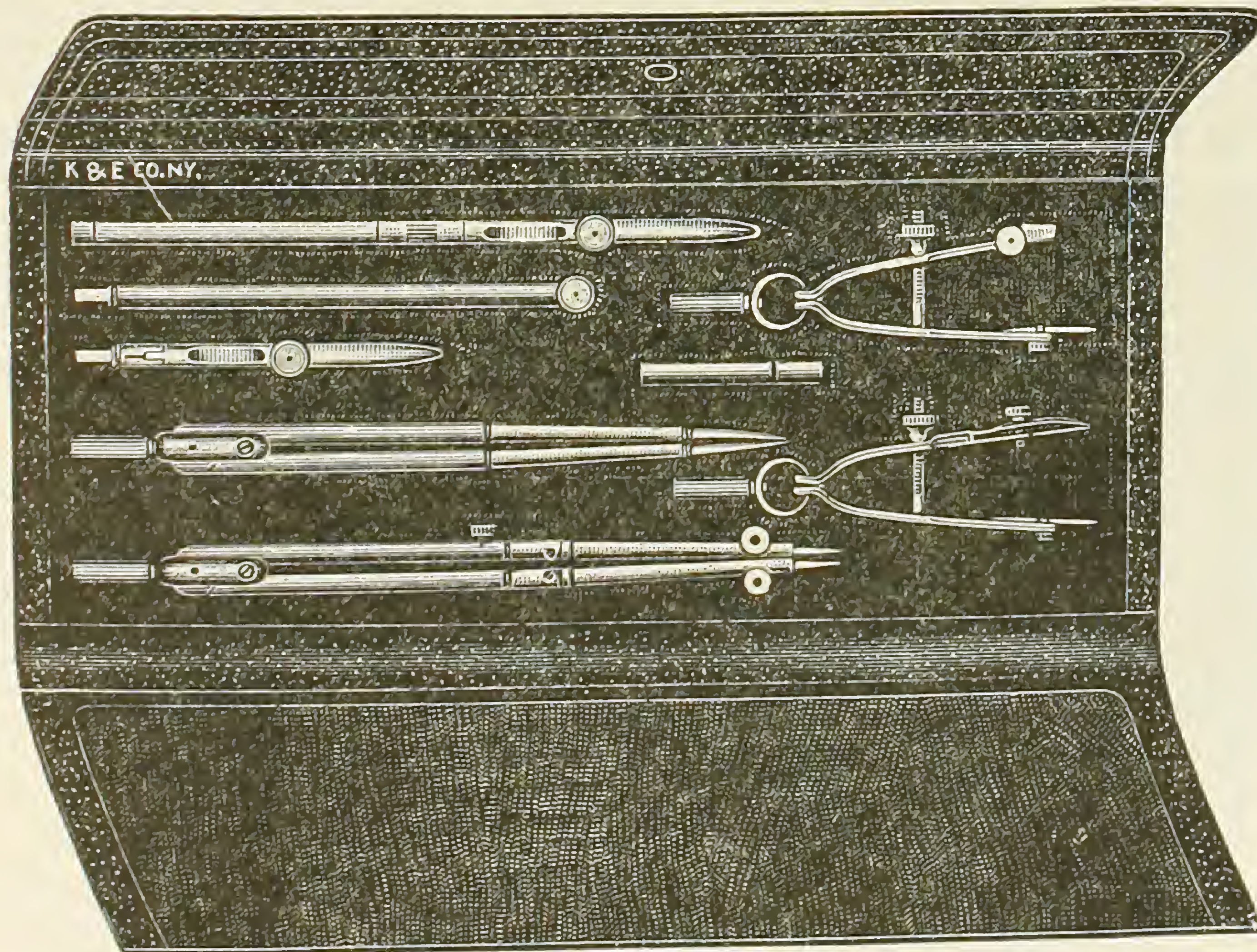
Each Instrument stamped "Minusa" and K & E CO.



No. N 784.

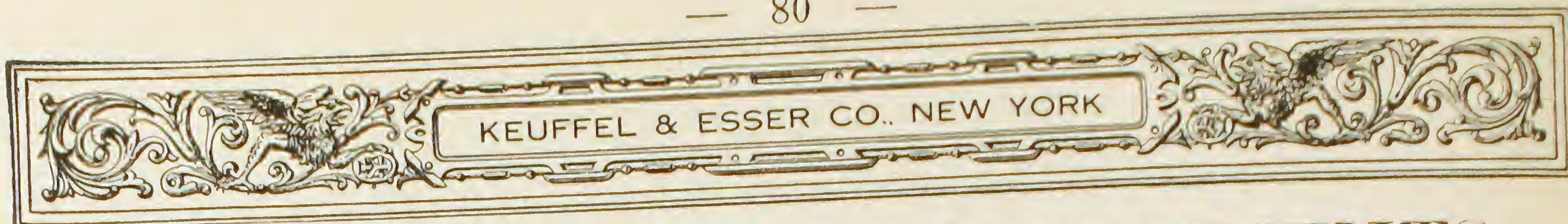
N 784. Pocket Case containing:—

- 1 Compasses 6½ in., with fixed Needle Point, Pen, Pencil Point, and Lengthening Bar, No. N 750,
- 1 Plain Divider, 5½ in., No. N 746,
- 1 Steelspring Bow Pen, 3½ in., No. N 761,
- 1 Drawing Pen, 5½ in., upper blade with spring, No. N 774,
- 1 Lead Box, containing 3 leads, No. N 759each, \$



No. N 784½.

N 784½. Pocket Case containing same assortment as No. N 784, but with the addition of 1 Steelspring Bow Pencil No. N762, each, \$

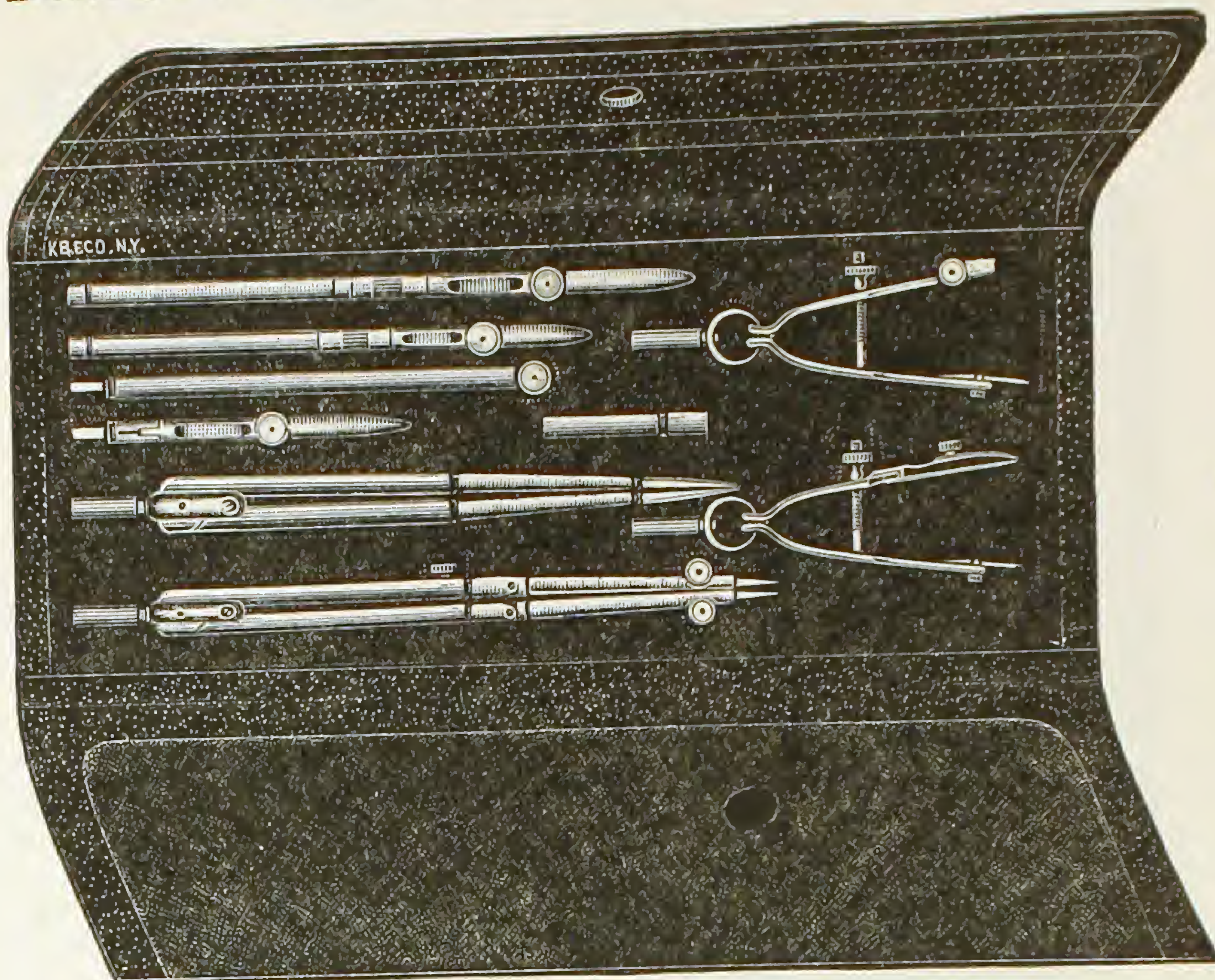


MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

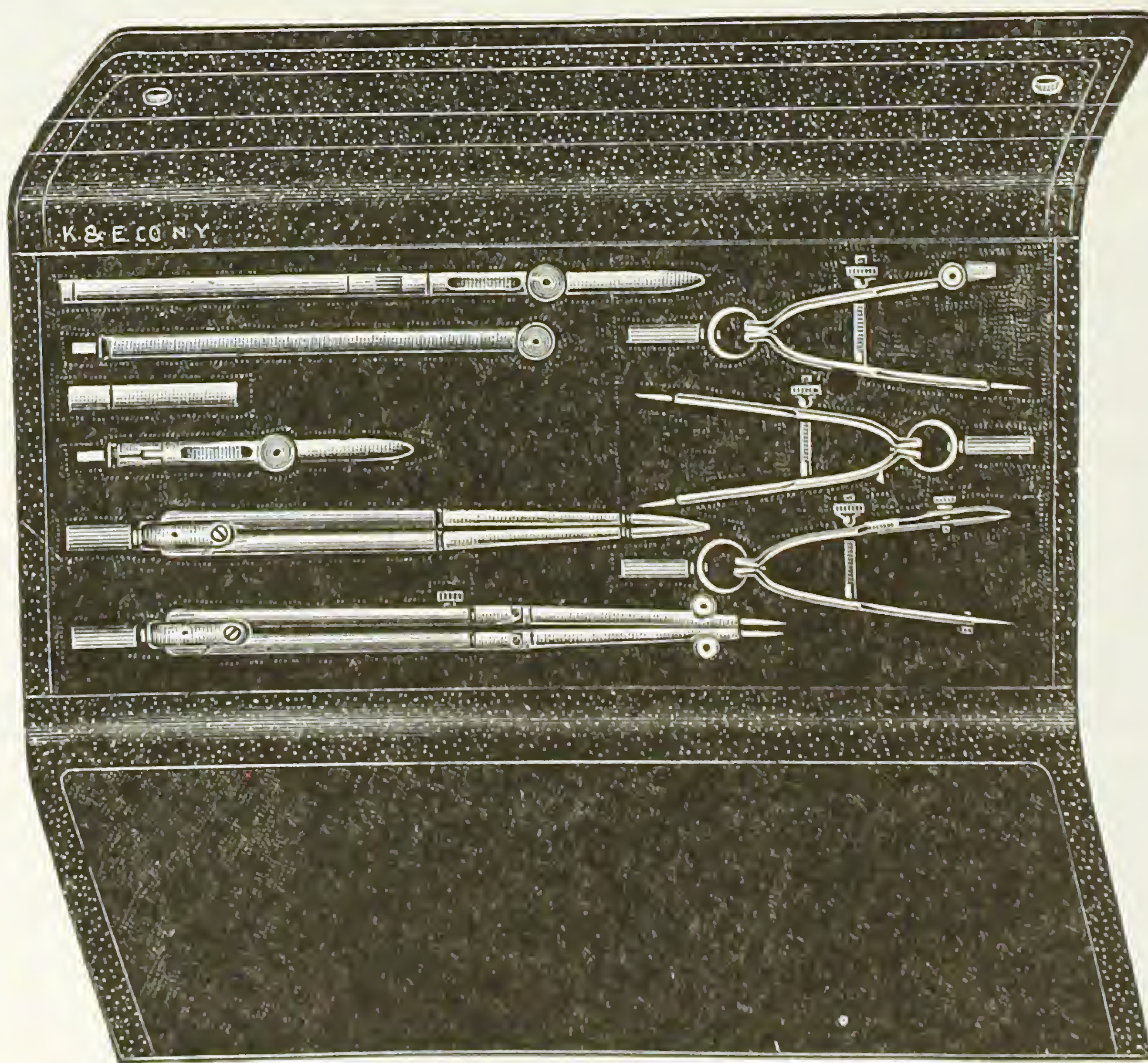
Each Instrument stamped "Minusa" and K & E CO.



No. N 785.

N 785. Pocket Case containing:—

- 1 Compasses, 6½ in., No. N 750,
- 1 Plain Divider, 5½ in., No. N 746,
- 1 Steelspring Bow Pen, 3½ in., No. N 761,
- 1 Steelspring Bow Pencil, 3½ in., No. N 762,
- 2 Drawing Pens, 4½ in. and 5½ in., Nos. N 772 and N 774,
- 1 Lead Box containing 3 leads, No. N 759.....each, \$



No. N 785½.

N 785½. Pocket Case containing same assortment as No. N 785, but with the addition of Bow Divider No. N 760 and without Pen No. N 772.....each, \$

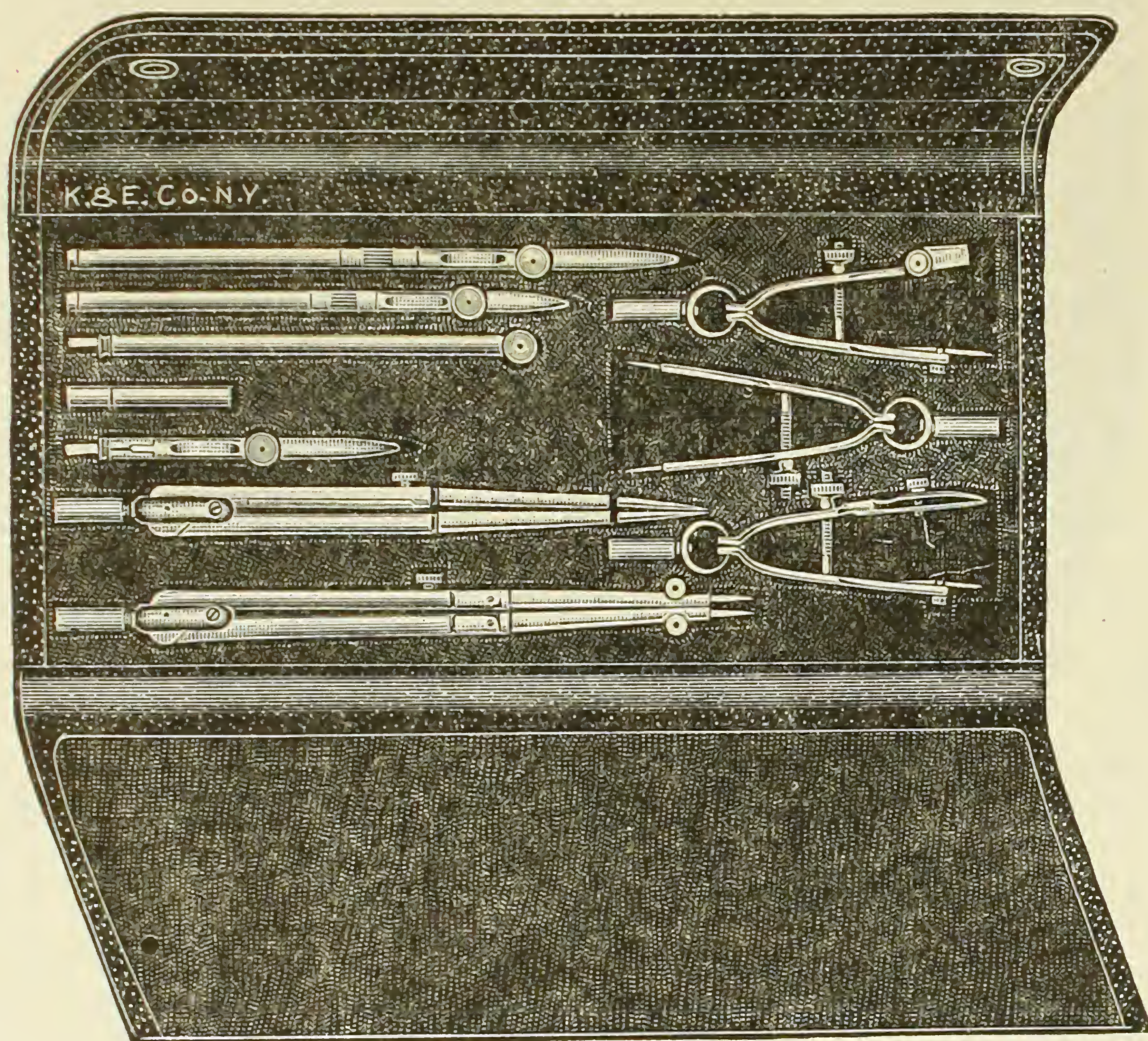


MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

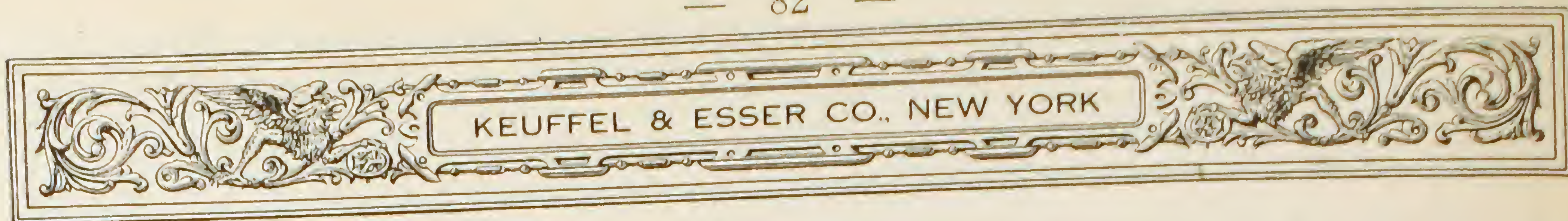
Each Instrument stamped "Minusa" and K & E Co.



No. N786.

N 786. Pocket Case containing:—

- 1 Compasses $6\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750,
- 1 Hairspring Divider, $5\frac{1}{2}$ in. No. N 748,
- 1 Steelspring Bow Divider, $3\frac{1}{2}$ in., No. N 760,
- 1 Steelspring Bow Pen, $3\frac{1}{2}$ in., No. N 761,
- 1 Steelspring Bow Pencil, $3\frac{1}{2}$ in., No. N 762,
- 1 Drawing Pen, $4\frac{1}{2}$ in., No. N 772,
- 1 Drawing Pen, $5\frac{1}{2}$ in., No. N 774,
- 1 Lead Box containing 3 leads, No. N 759.....each, \$

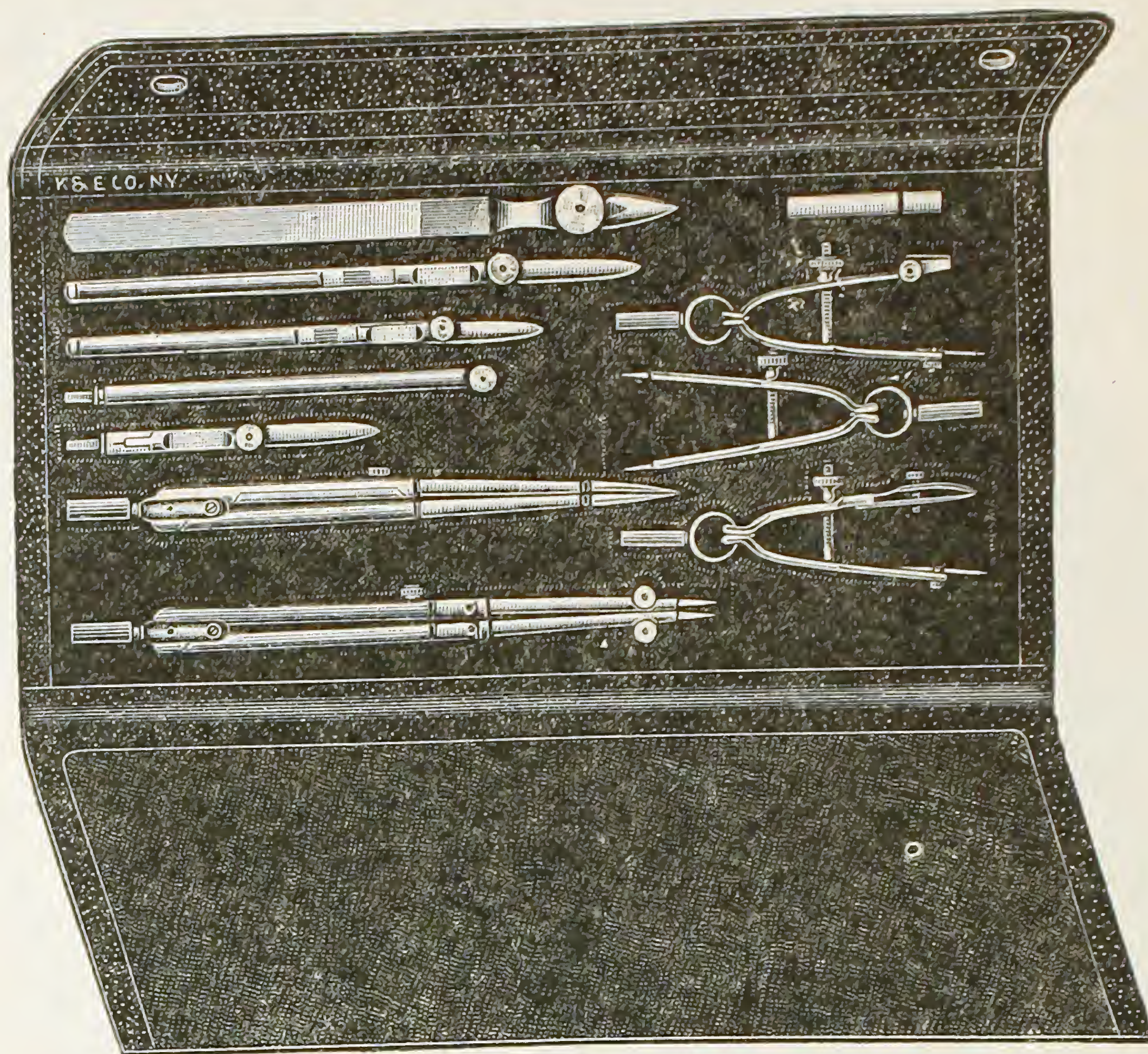


MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

Made in the U. S. A.

Each Instrument stamped "Minusa" and K & E CO.



No. N 786 $\frac{1}{4}$.

N 786 $\frac{1}{4}$. Pocket Case containing:—

- 1 Compasses 6 $\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750,
- 1 Plain Divider, 5 $\frac{3}{4}$ in., No. N 746,
- 1 Steelspring Bow Divider, 3 $\frac{1}{2}$ in., No. N 760,
- 1 Steelspring Bow Pen, 3 $\frac{1}{2}$ in., No. N 761,
- 1 Steelspring Bow Pencil, 3 $\frac{1}{2}$ in., No. N 762,
- 1 Drawing Pen, 4 $\frac{1}{2}$ in., No. N 772,
- 1 Drawing Pen 5 $\frac{1}{2}$ in., No. N 774,
- 1 Detail Pen, 6 $\frac{1}{2}$ in., No. N 777,
- 1 Lead Box containing 3 leads, No. N 759.....each, \$

N 786 $\frac{1}{2}$. Pocket Case containing:—

- Same assortment as No. N 786 $\frac{1}{4}$, but with Hairspring Divider No. N 748 in place of Plain Divider,....each, \$

N 787. Pocket Case containing:—

- 1 Compasses 6 $\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750,
- 1 Hairspring Divider, 5 $\frac{3}{4}$ in., No. N 748,
- 1 Steelspring Bow Divider, 3 $\frac{1}{2}$ in., No. N 760,
- 1 Steelspring Bow Pen, 3 $\frac{1}{2}$ in., No. N 761,
- 1 Steelspring Bow Pencil, 3 $\frac{1}{2}$ in., No. N 762,
- 1 Drawing Pen, 4 $\frac{1}{2}$ in., No. N 772,
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., No. N 774,
- 1 Barch-Payzant Lettering Pen, No. 6,
- 1 Lead Box containing 3 leads, No. N 759.....each, \$

KEUFFEL & ESSER CO., NEW YORK

MINUSA *Special*

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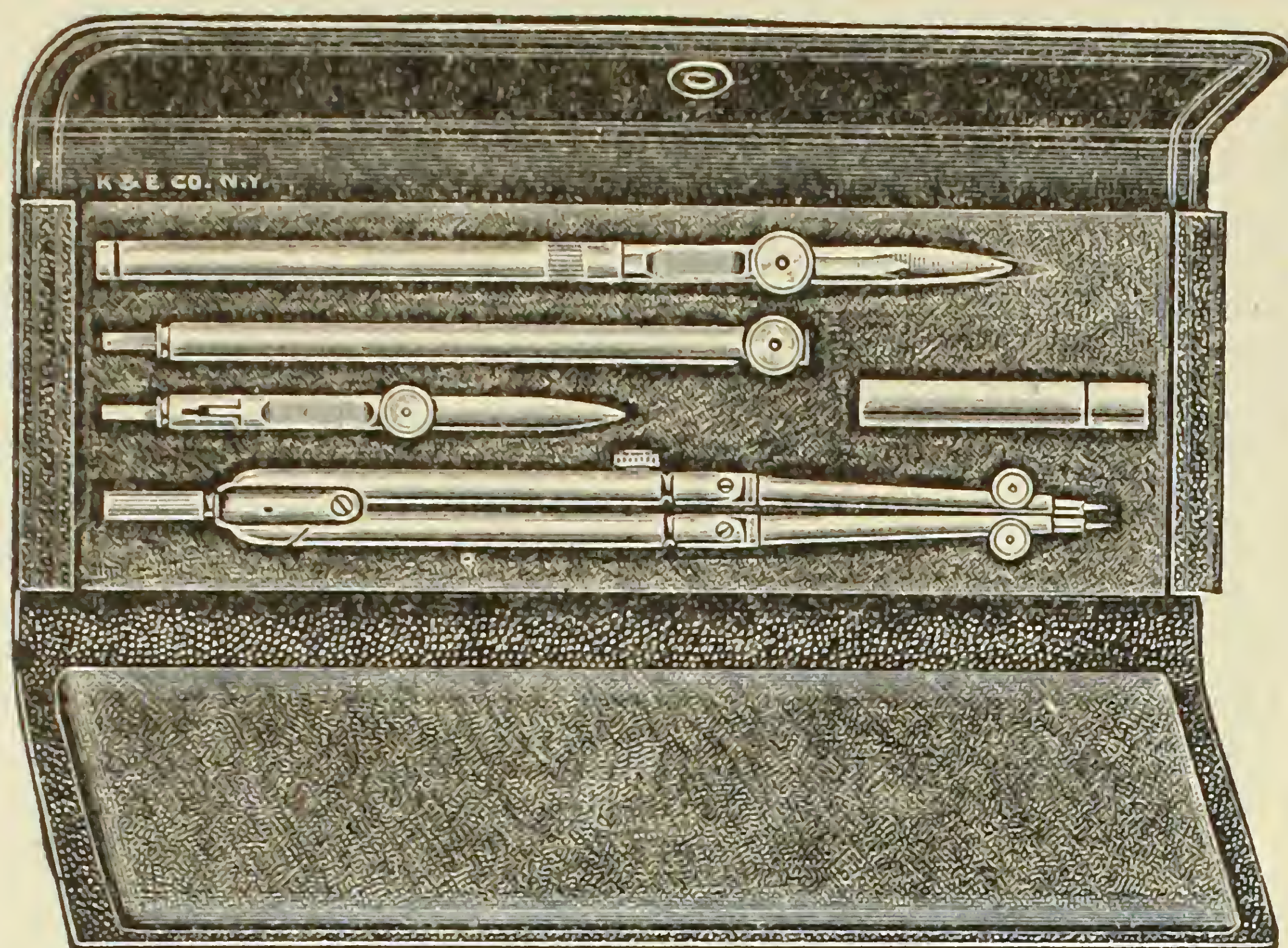
DRAWING INSTRUMENTS.

Made in the U. S. A.

Each Instrument stamped "Minusa" and K & E CO.

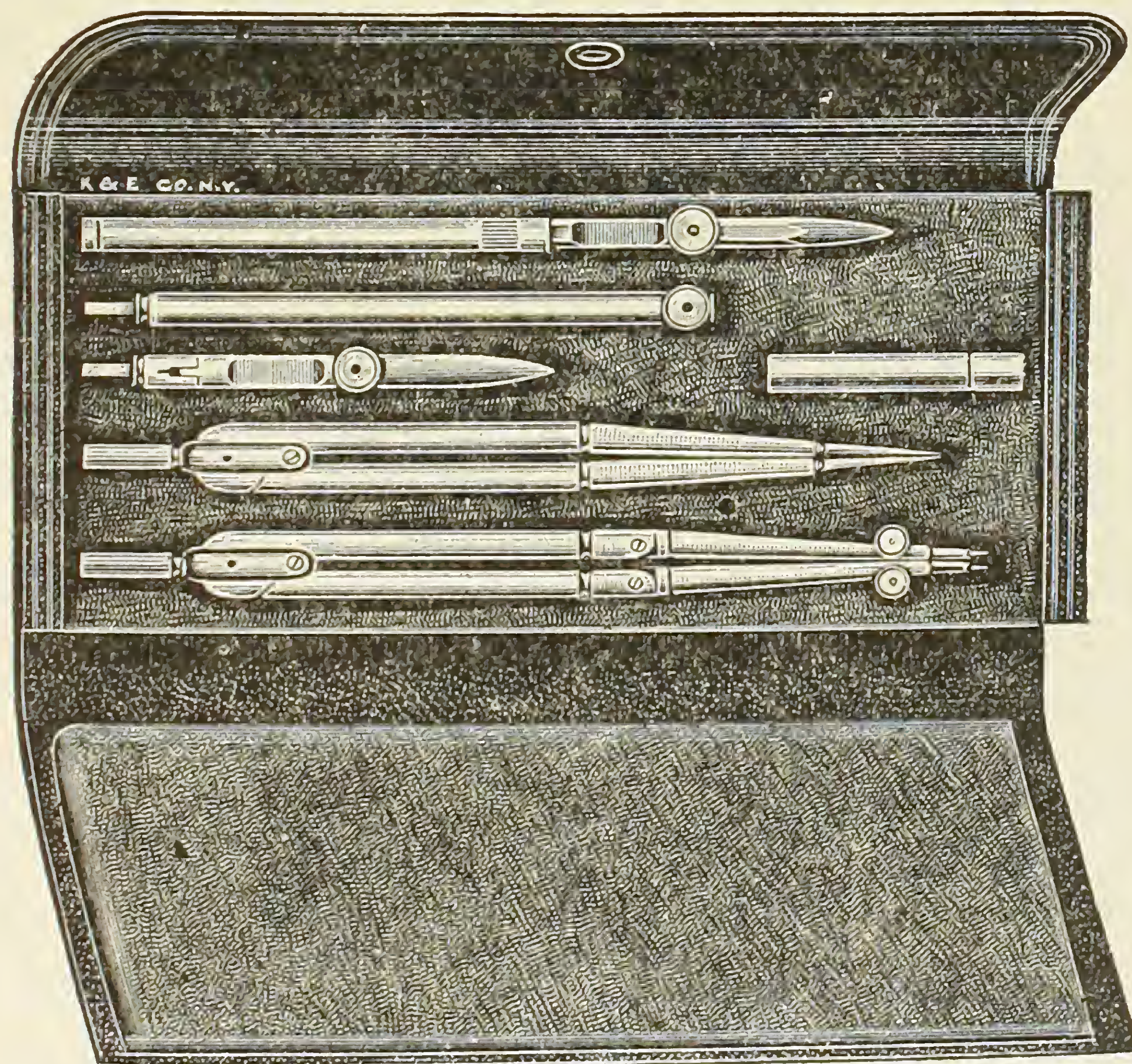
Sets are in genuine Morocco Leather Cases with Silk Velvet Lining.

For description of construction of Minusa Special Instruments, see pages 65 to 70.



No. N 790.

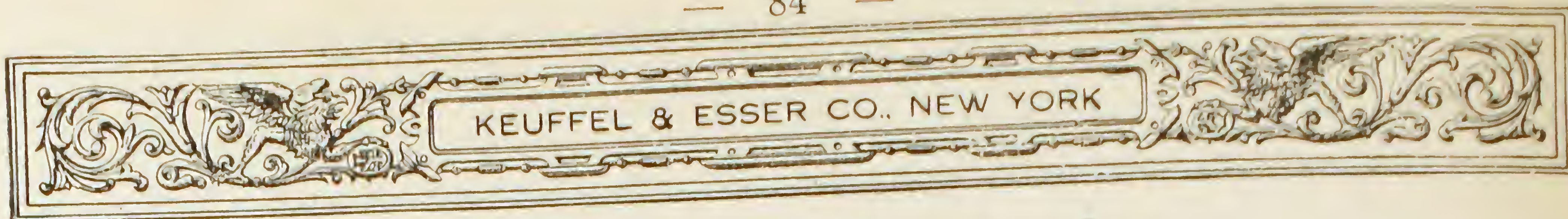
N 790. Pocket Case containing:—

1 Compasses, $6\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil
Point and Lengthening Bar, No. N 750,1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No.
N 774 $\frac{1}{2}$.1 Lead Box containing 3 leads, No. N 759 $\frac{1}{2}$ each, \$

No. N 792.

N 792. Pocket Case containing:—

1 Compasses, $6\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil
Point, and Lengthening Bar, No. N 750,1 Plain Divider, $5\frac{1}{2}$ in., No. N 746,1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No.
N 774 $\frac{1}{2}$.1 Lead Box containing 3 leads, No. N 759 $\frac{1}{2}$ each, \$



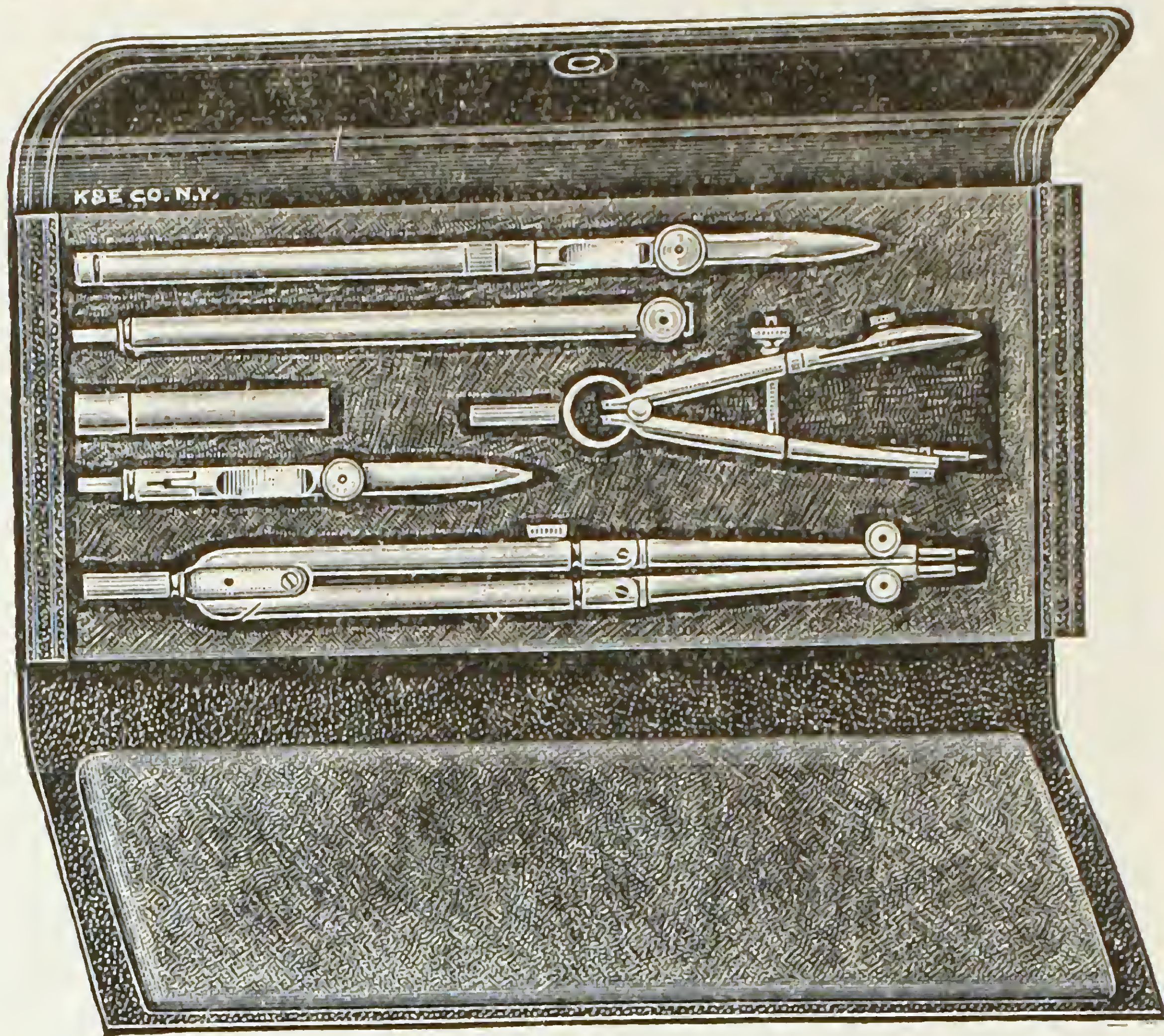
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DRAWING INSTRUMENTS.

Made in the U. S. A.

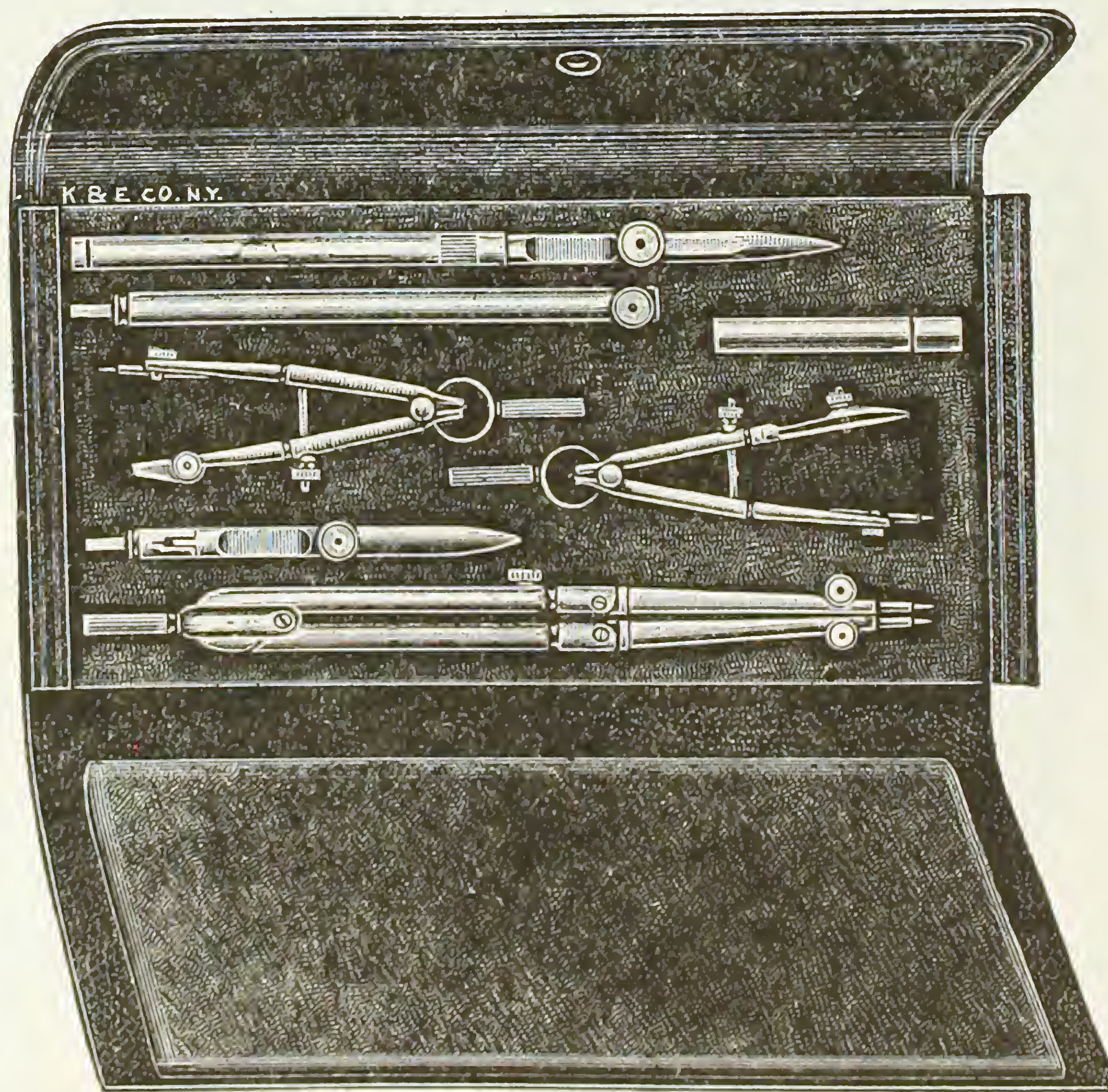
Each Instrument stamped "Minusa" and K & E CO.



No. N 793.

N 793. Pocket Case containing:—

- 1 Compasses, $6\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750
- 1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring, No N 774 $\frac{1}{2}$,
- 1 Steelspring Bow Pen, $3\frac{1}{2}$ in., No. N 761 $\frac{1}{2}$,
- 1 Lead Box, containing 3 leads, No. N 759 $\frac{1}{2}$each, \$



No. N 793 $\frac{1}{2}$.

N 793 $\frac{1}{2}$. Pocket Case, containing same assortment as No. N 793, but with the addition of 1 Steelspring Bow Pencil, No. N 762 $\frac{1}{2}$each, \$



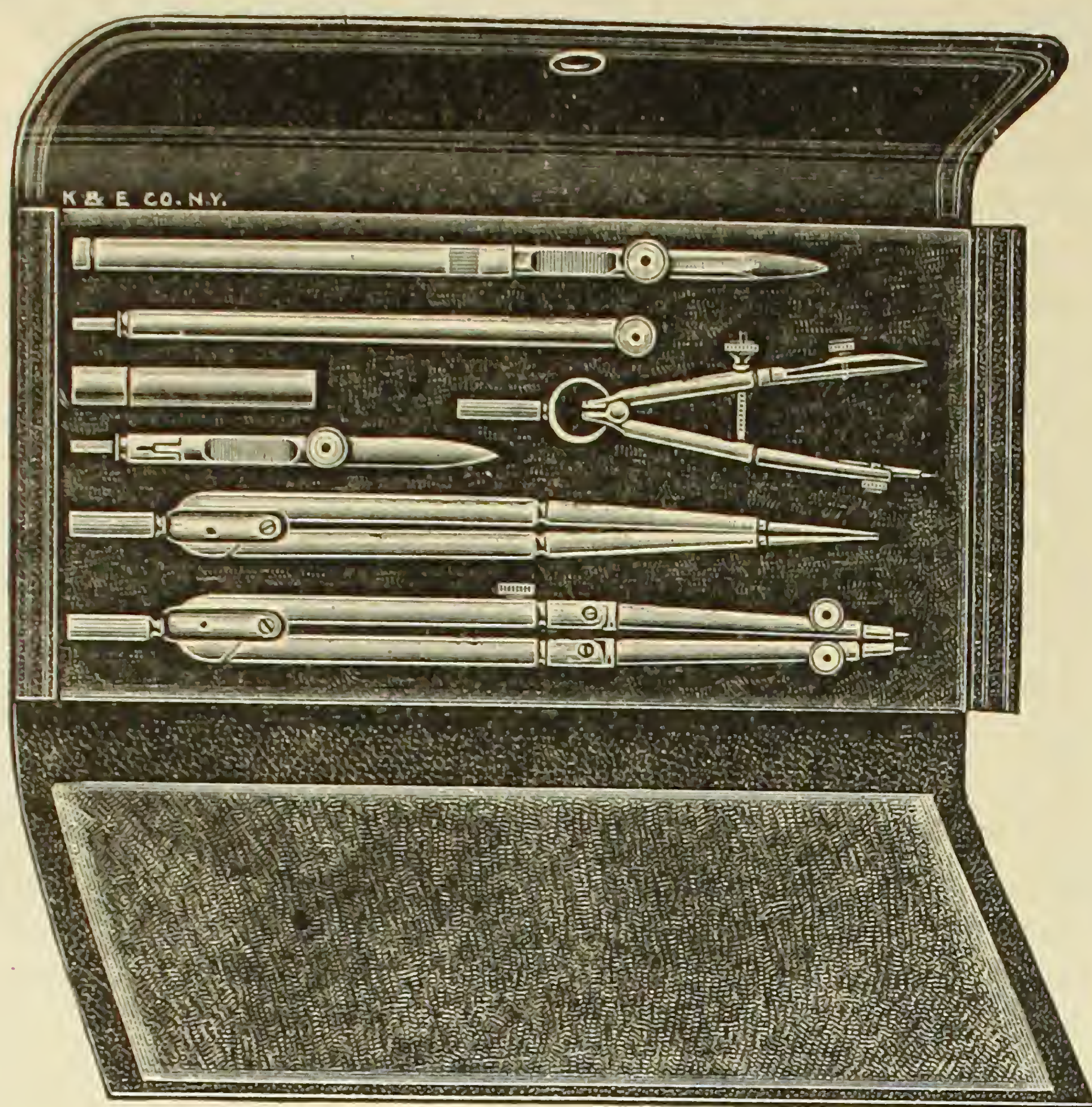
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DRAWING INSTRUMENTS.

Made in the U. S. A.

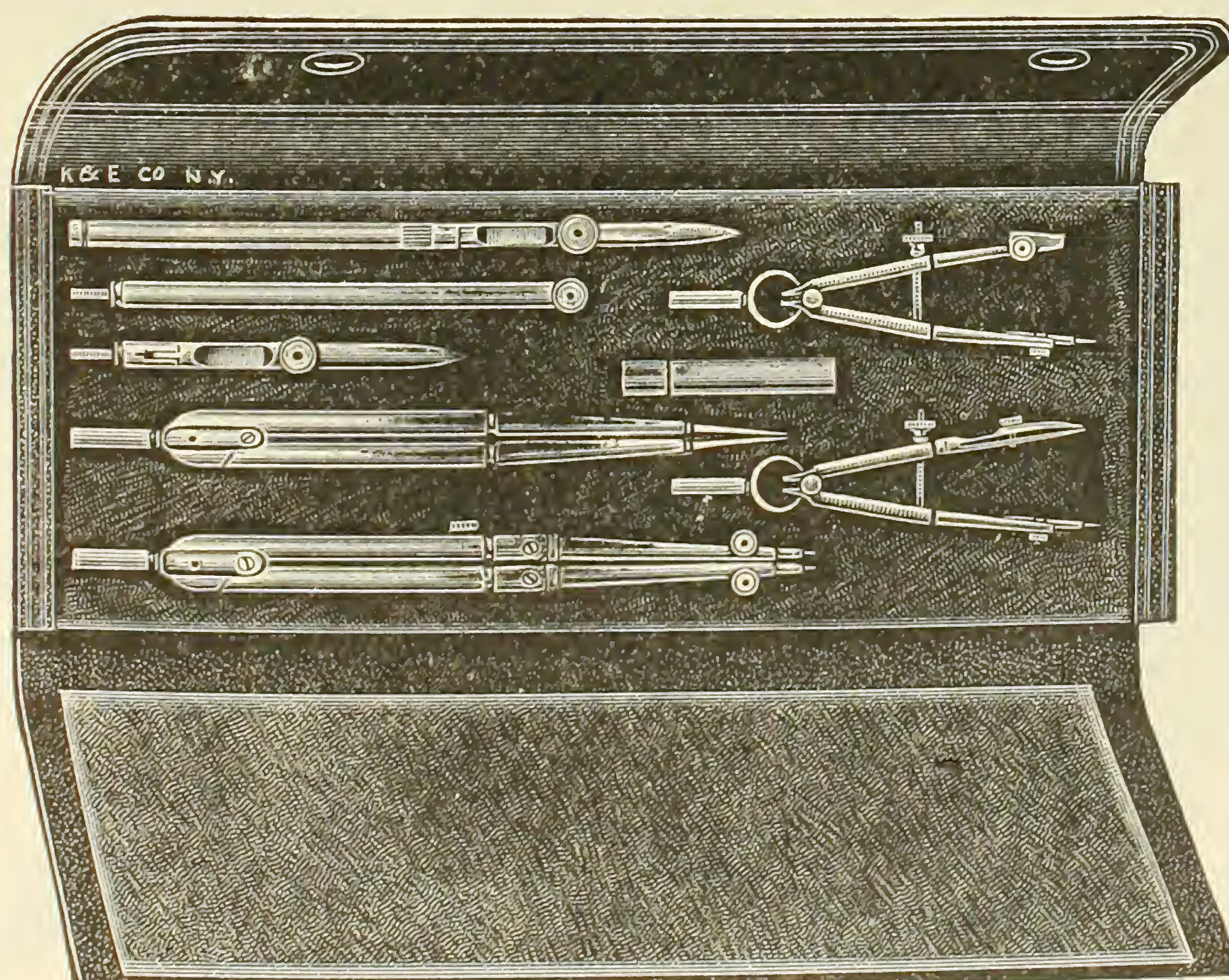
Each Instrument stamped "Minusa" and K & E CO.



No. N 794.

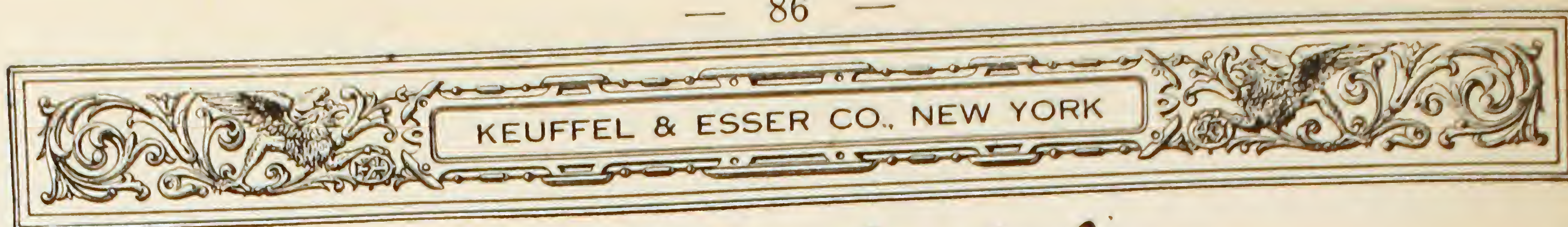
N 794. Pocket Case containing:—

- 1 Compasses 6½ in., with fixed Needle Point, Pen, Pencil Point, and Lengthening Bar, No. N 750,
- 1 Plain Divider, 5½ in., No. N 746,
- 1 Steelspring Bow Pen, 3½ in., No. N 761½,
- 1 Drawing Pen, 5½ in., upper blade with spring, No. N 774½,
- 1 Lead Box, containing 3 leads, No. N 759½ each, \$

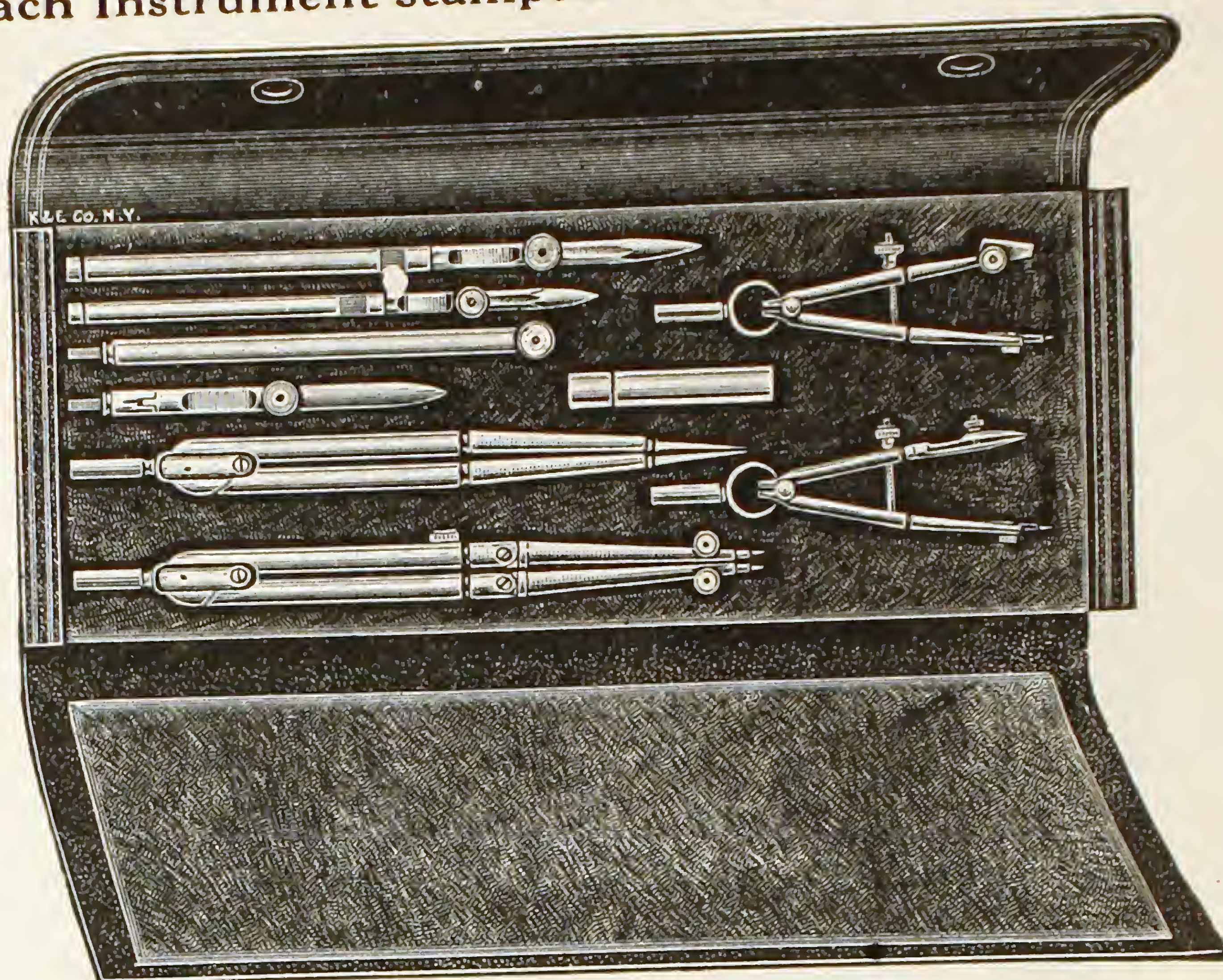


No.
N 794½.

N 794½. Pocket Case containing same assortment as No. N 794, but with the addition of 1 Steelspring Bow Pencil No. N 762½, each, \$

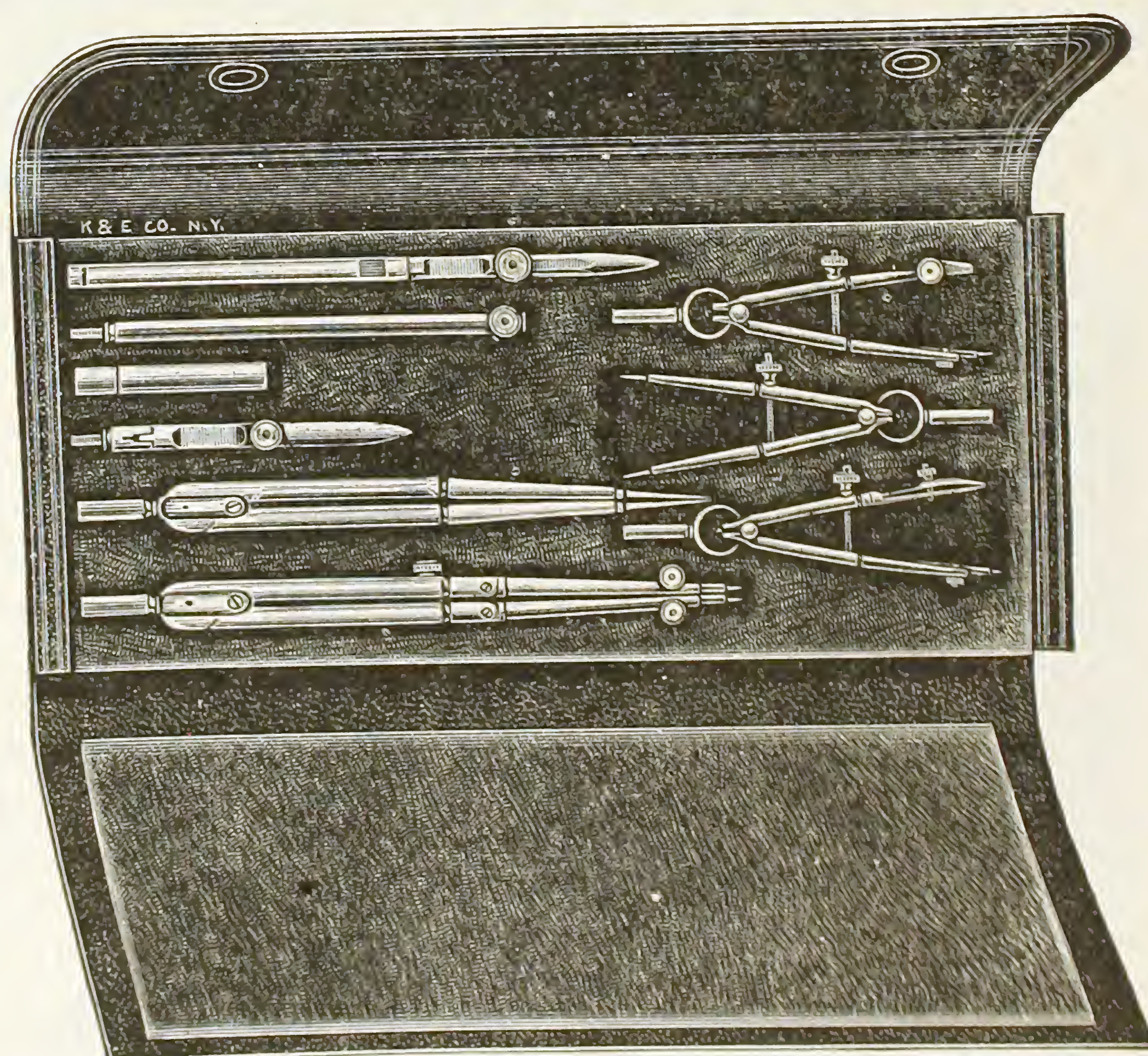


MINUSA Special
 REG. U. S. PAT. OFF.
DRAWING INSTRUMENTS.
 Made in the U. S. A.
 Each Instrument stamped "Minusa" and K & E CO.



No.
 N 795.

- N 795. Pocket Case containing:—
 1 Compasses, 6½ in., No. N 750,
 1 Plain Divider, 5½ in., No. N 746,
 1 Steelspring Bow Pen, 3½ in., No. N 761½,
 1 Steelspring Bow Pencil, 3½ in., No. N 762½,
 2 Drawing Pens, 4½ in. and 5½ in., Nos. N 772½ and N 774½,
 1 Lead Box containing 3 leads, No. N 759½.....each, \$



No. N 795½.

- N 795½. Pocket Case containing same assortment as No. N 795, but
 with the addition of Bow Divider No. N 760½, and
 without Pen No. N 772½.....each, \$



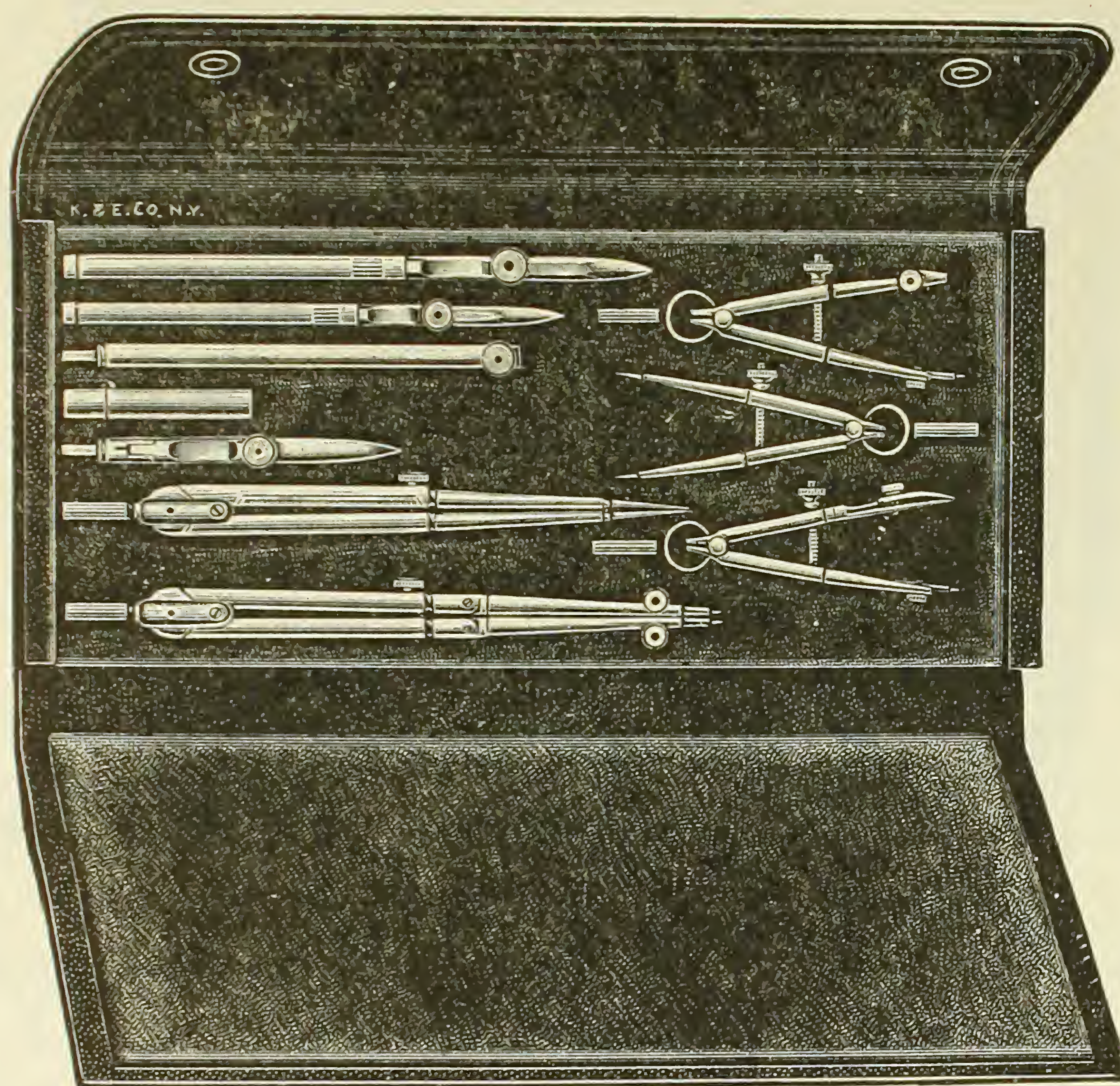
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DRAWING INSTRUMENTS.

Made in the U. S. A.

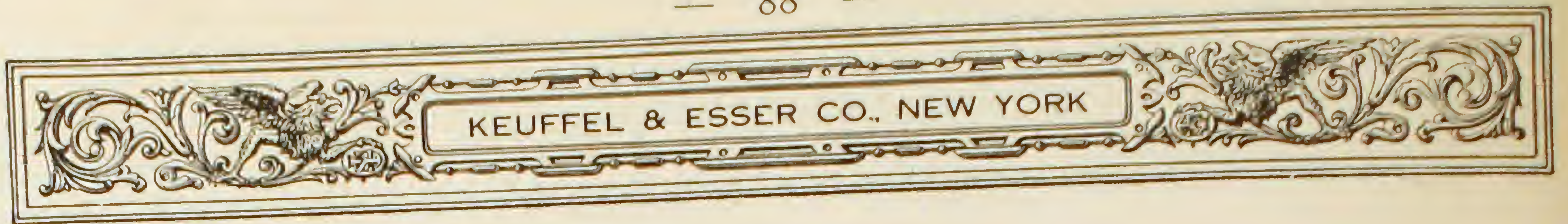
Each Instrument stamped "Minusa" and K & E CO.



No. N 796.

N 796. Pocket Case containing:—

- 1 Compasses $6\frac{1}{2}$ in., with fixed Needle Point, Pen, Pencil
Point and Lengthening Bar, No. N 750,
- 1 Hairspring Divider, $5\frac{1}{2}$ in. No. N 748,
- 1 Steelspring Bow Divider, $3\frac{1}{2}$ in., No. N 760 $\frac{1}{2}$,
- 1 Steelspring Bow Pen, $3\frac{1}{2}$ in., No. N 761 $\frac{1}{2}$,
- 1 Steelspring Bow Pencil, $3\frac{1}{2}$ in., No. N 762 $\frac{1}{2}$,
- 1 Drawing Pen, $4\frac{1}{2}$ in., No. N 772 $\frac{1}{2}$,
- 1 Drawing Pen, $5\frac{1}{2}$ in., No. N 774 $\frac{1}{2}$,
- 1 Lead Box containing 3 leads, No. N 759 $\frac{1}{2}$ each, \$



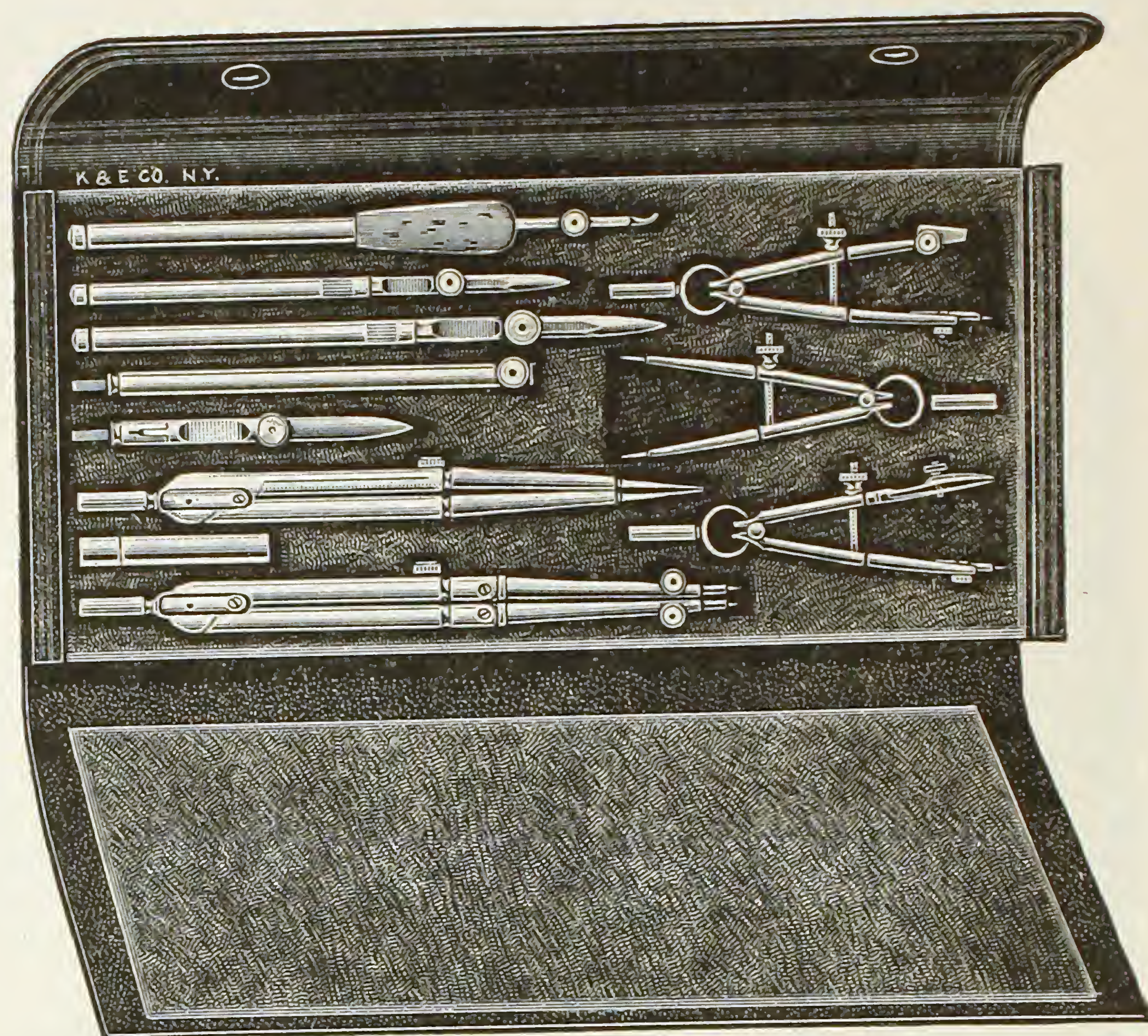
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REG. U. S. PAT. OFF.

DRAWING INSTRUMENTS.

Made in the U. S. A.

Each Instrument stamped "Minusa" and K & E CO.



No. N 797

N 796½. Pocket Case containing:—

- 1 Compasses 6½ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750,
- 1 Hairspring Divider 5¾ in., No. N 748,
- 1 Steelspring Bow Divider, 3½ in., No. N 760½,
- 1 Steelspring Bow Pen, 3½ in., No. N 761½,
- 1 Steelspring Bow Pencil, 3½ in., No. N 762½,
- 1 Drawing Pen 4½ in., No. N 772½,
- 1 Drawing Pen, 5½ in., No. N 774½,
- 1 Detail Pen, 6½ in., No. N 777,
- 1 Lead Box containing 3 leads, No. N 759½.....each, \$

N 797. Pocket Case containing:—

- 1 Compasses 6½ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. N 750,
- 1 Hairspring Divider, 5¾ in., No. N 748,
- 1 Steelspring Bow Divider, 3½ in., No. N 760½,
- 1 Steelspring Bow Pen, 3½ in., No. N 761½,
- 1 Steelspring Bow Pencil, 3½ in., No. N 762½,
- 1 Drawing Pen, 4½ in., No. N 772½,
- 1 Drawing Pen, 5½ in., No. N 774½,
- 1 Barch-Payzant Lettering Pen, No. 8,
- 1 Lead Box containing 3 leads, No. N 759½.....each, \$

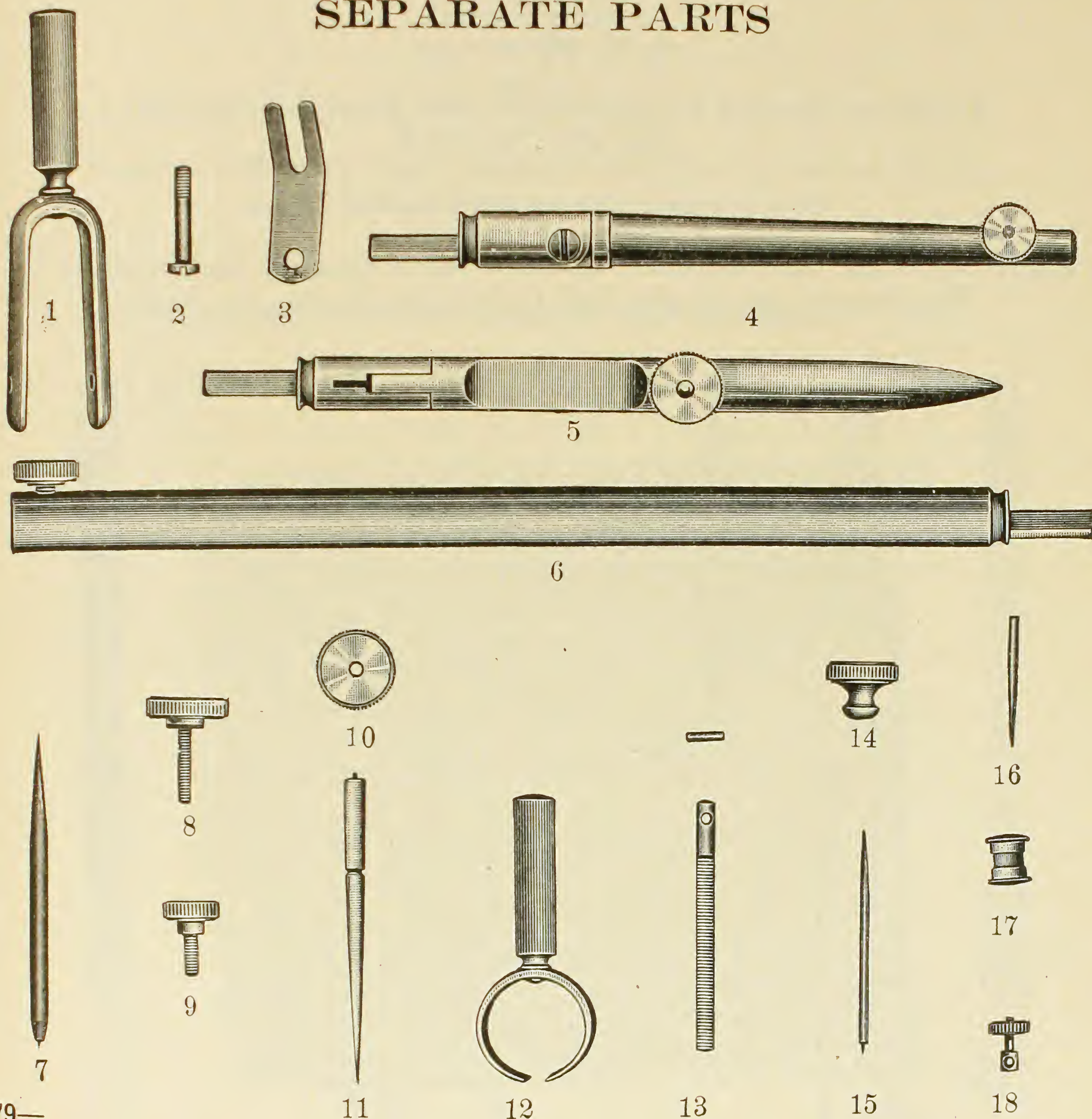


MINUSA DRAWING INSTRUMENTS.

REG. U. S. PAT. OFF.

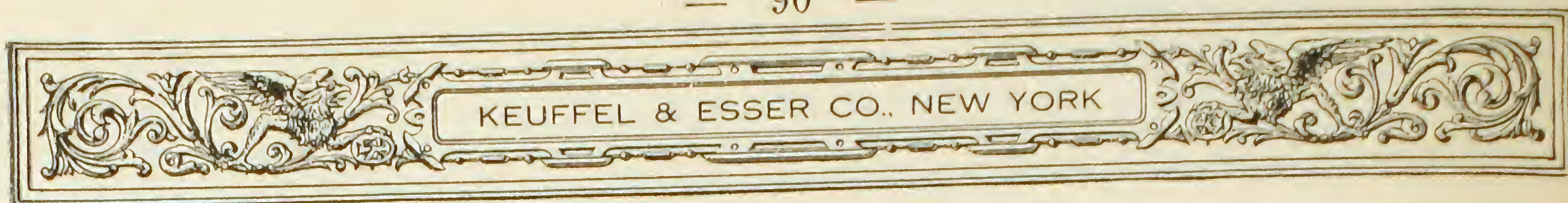
Made in the U. S. A.

SEPARATE PARTS



779—

- | | | | |
|----|--|----|--|
| 1 | Compass and Divider fork & handle | 8c | Hairspring divider adjusting screw |
| 2 | Compass and Divider fork screw | 8d | Hairspring compass " " |
| 3 | Compass and Divider fork friction spring | 12 | Bow spring head and handle |
| 4 | Compass pencil leg. | 13 | Bow adjusting screw and pin |
| 5 | Compass pen leg | 14 | Bow adjusting nut |
| 6 | Compass lengthening bar | 15 | Bow shouldered needle |
| 7 | Compass needle | 16 | Bow divider needle |
| 8a | Compass socket leg clamp screw | 17 | Bow hinge roller |
| 8b | Compass lengthening bar clamp screw | 18 | Bow needle lock screw and nut |
| 9a | Compass pencil and needle leg clamp screws | 9b | Bow pen adjusting screw |
| 10 | Compass pen adjusting nut | 9c | Bow pencil clamp screw |
| 11 | Divider needle | 8e | Large ruling pen (5½") adjusting screw |
| | | 8f | Small ruling pen (4½") adjusting screw |



ARROW DRAWING INSTRUMENTS.

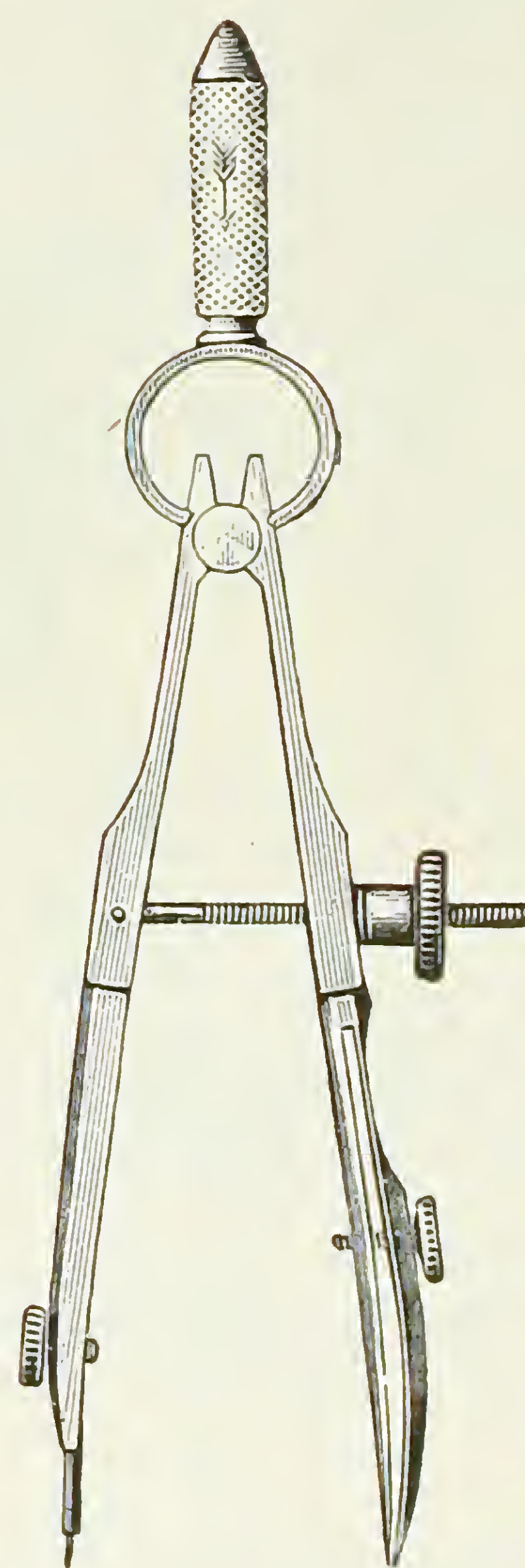
(FLAT TYPE)

"TRADE  MARK"

Excellent Quality Instruments, with Straightening Device
NICKEL SILVER

Each instrument stamped with trade-mark 

Arrow Drawing Instruments, made of high quality nickel silver and finest steel, are of the very best workmanship and finish.



Compass.

Bow Pen.

Drawing Pen.

Arrow Instruments are not furnished separately.




ARROW DRAWING INSTRUMENTS. (FLAT TYPE)

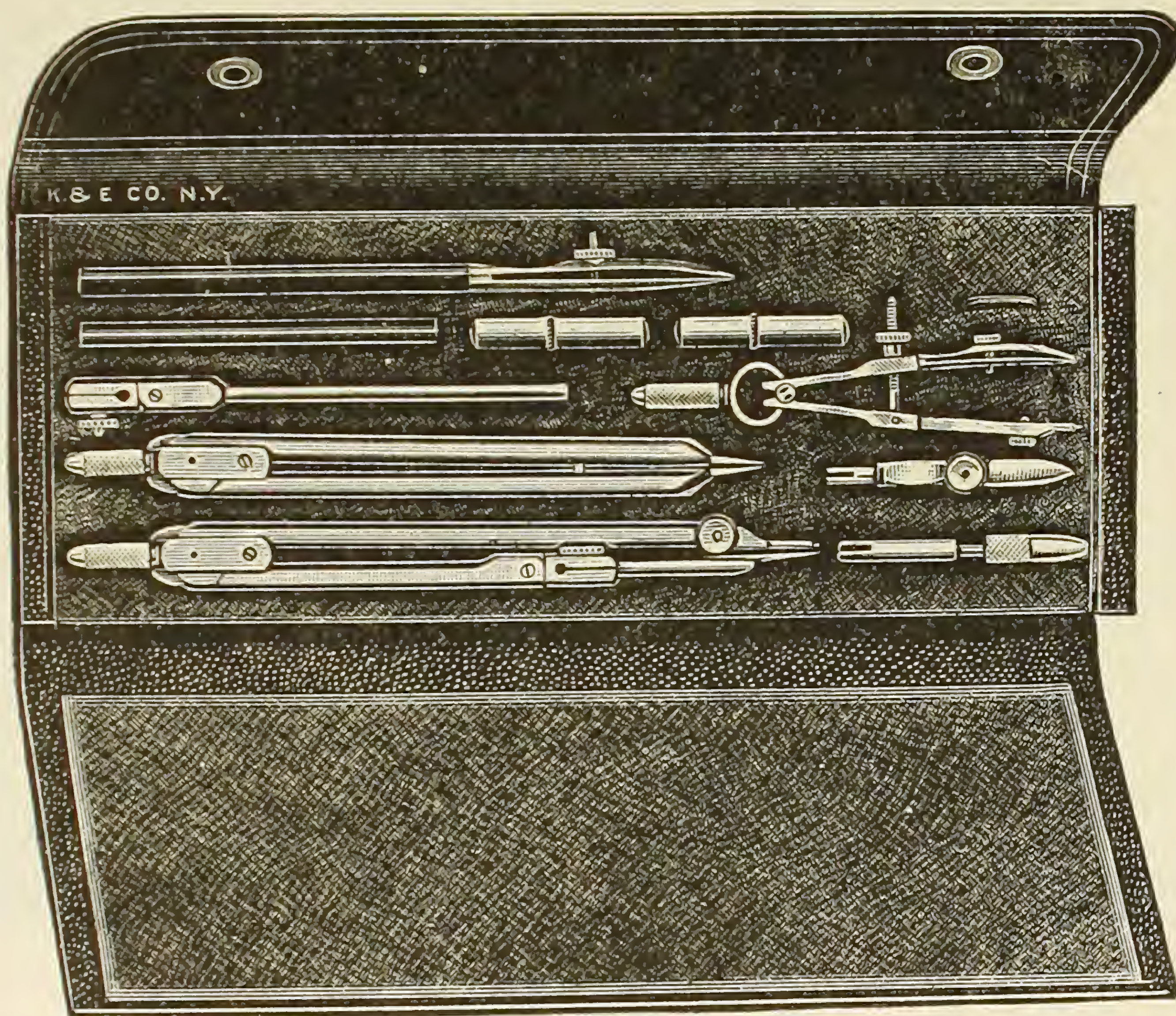
"TRADE  MARK"

Excellent Quality Instruments, with Straightening Device

NICKEL SILVER

Each instrument stamped with trade-mark 

IN MOROCCO FINISH CASES WITH VELVET LINING.



No. 1084.

1080. Pocket Case containing:—
1 Compasses, $6\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil
Point and Lengthening Bar,
1 Drawing Pen, $5\frac{1}{2}$ in., upper blade with spring,
1 Extra handle, 3 in., for compass pen,
1 nickel silver Box with 3 Leads,
1 nickel silver Box with 7 assorted needle Points. . . . each, \$
1082. Same as 1080, with addition of
1 Plain Divider, 6 in. each, \$




ARROW DRAWING INSTRUMENTS. (FLAT TYPE)

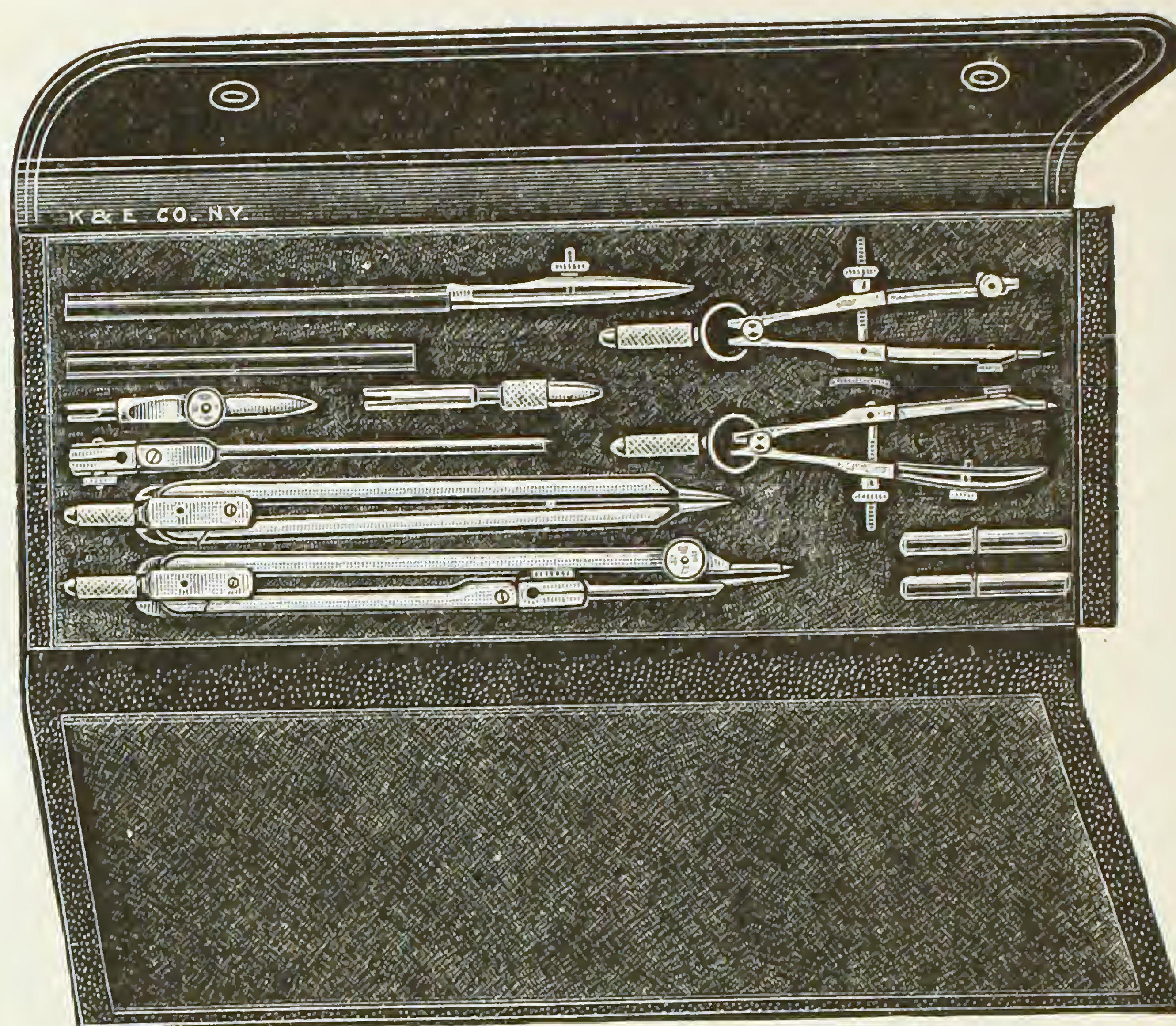
“TRADE  MARK”

Excellent Quality Instruments, with Straightening Device

NICKEL SILVER

Each instrument stamped with trade-mark 

IN MOROCCO FINISH CASES WITH VELVET LINING.



No. 1084 $\frac{1}{2}$.

1033. Pocket Case containing:—

- 1 Compasses, 6 $\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point, and Lengthening Bar,
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring,
- 1 Extra Handle, 3 in., for compass pen,
- 1 Steelspring Bow Pen, 4 in.,
- 1 nickel silver Box with 3 Leads,
- 1 nickel silver Box with 7 assorted Needle Points . . . each, \$

1083 $\frac{1}{2}$. Same as 1083, with addition of
1 Steelspring Bow Pencil. “

1084. Same as 1083, with addition of
1 Plain Divider, 6 in., “




ARROW DRAWING INSTRUMENTS.

(FLAT TYPE)

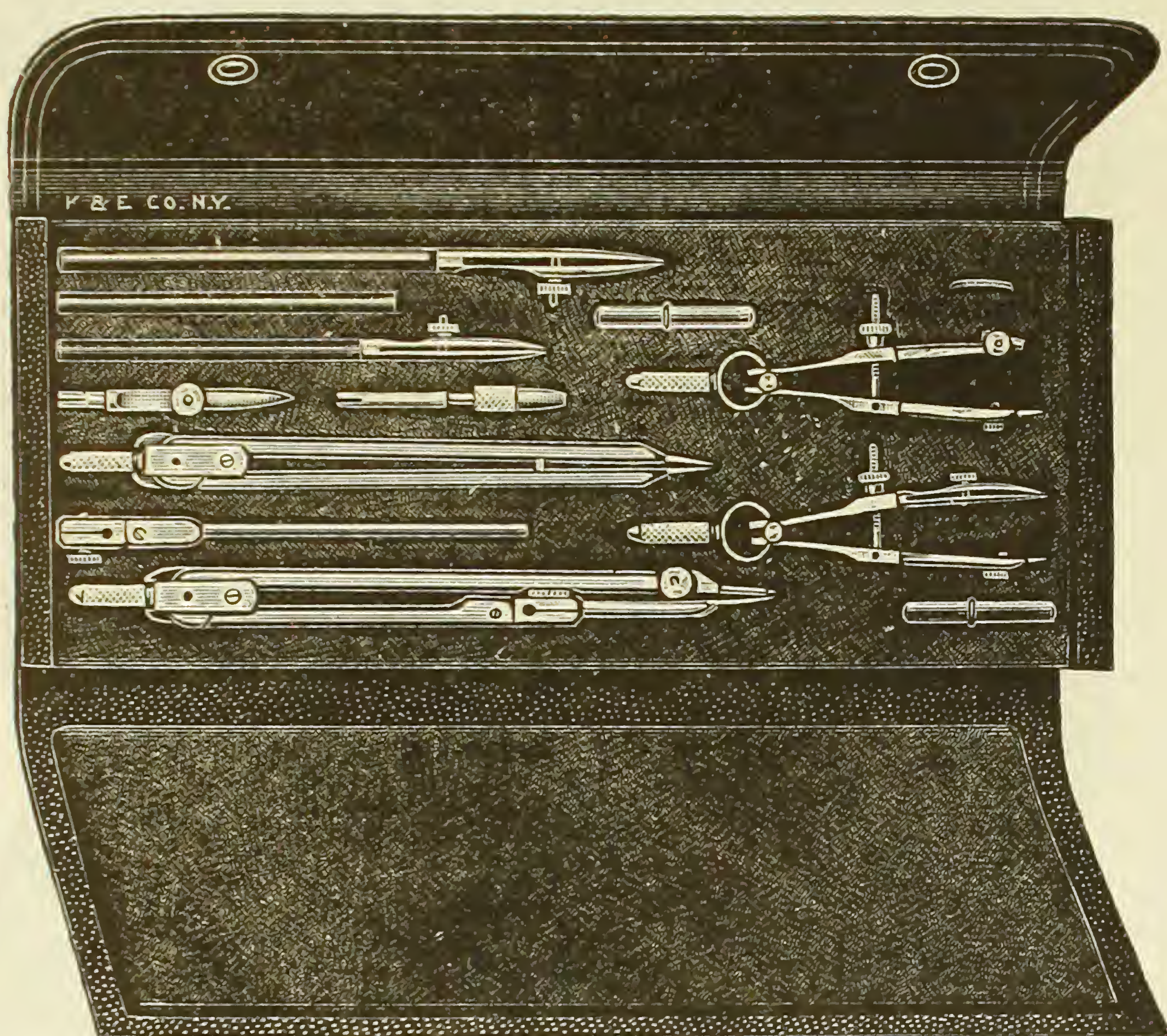
“TRADE  MARK”

Excellent Quality Instruments, with Straightening Device

NICKEL SILVER

Each instrument stamped with trade-mark 

IN MOROCCO FINISH CASES WITH VELVET LINING.

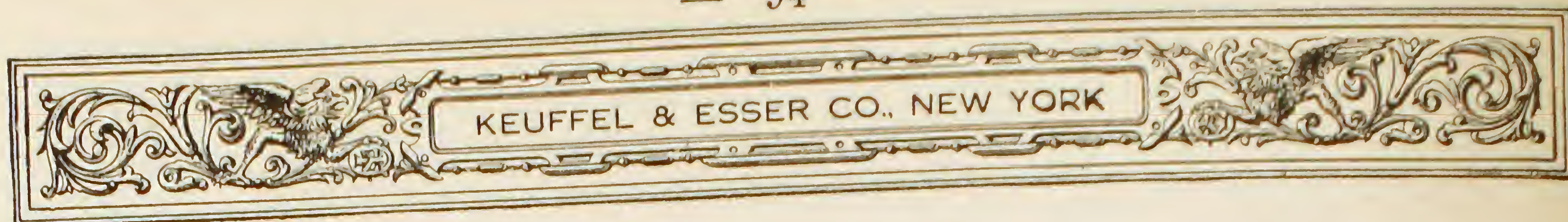


No. 1085.

1084 $\frac{1}{2}$. Pocket Case containing:—

- 1 Compasses, 6 $\frac{1}{4}$ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar,
- 1 Drawing Pen, 5 $\frac{1}{2}$ in., upper blade with spring,
- 1 Extra Handle, 3 in., for compass pen,
- 1 Plain Divider, 6 in.,
- 1 Steelspring Bow Pen, 4 in.,
- 1 Steelspring Bow Pencil; 4 in.,
- 1 nickel silver Box with 3 Leads,
- 1 nickel silver Box with 7 assorted Needle Points . . . each, \$

1085. Same as 1084 $\frac{1}{2}$, with addition of
1 Drawing Pen, 4 $\frac{1}{2}$ in. “




ARROW DRAWING INSTRUMENTS. (FLAT TYPE)

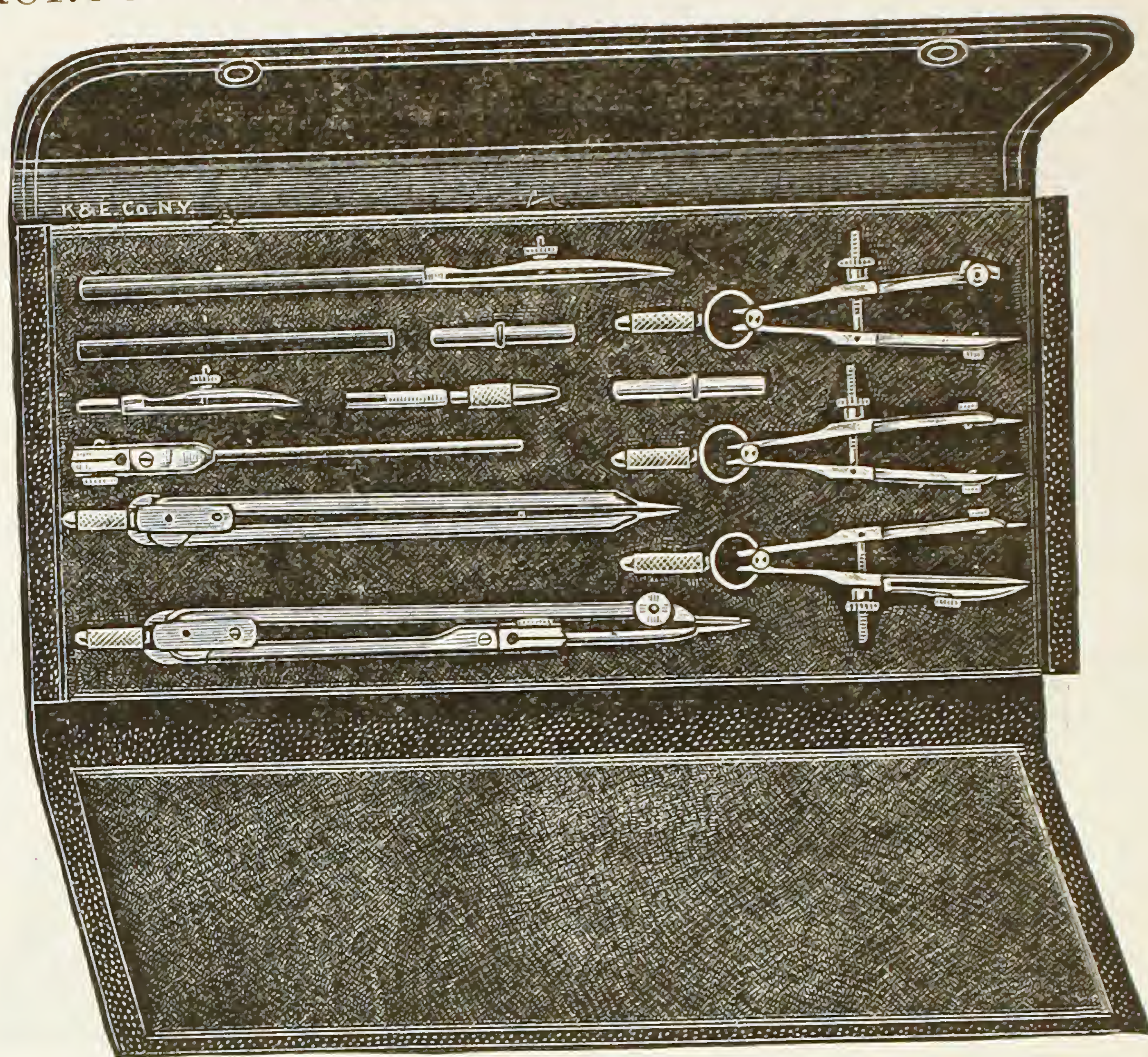
"TRADE  MARK"

Excellent Quality Instruments, with Straightening Device

NICKEL SILVER

Each instrument stamped with trade-mark 

IN MOROCCO FINISH CASES WITH VELVET LINING.



No. 1085½

1085½.

Pocket Case containing:—

- 1 Compasses, 6¼ in., with fixed Needle Point, Pen, Pencil Point and Lengthening Bar,
- 1 Drawing Pen, 5½ in., upper blade with spring,
- 1 Plain Divider, 6 in.,
- 1 Steelspring Bow Pen, 4 in.,
- 1 Steelspring Bow Pencil, 4 in.,
- 1 Steelspring Bow Divider, 4 in.,
- 1 Extra Handle, 3 in., for compass pen,
- 1 nickel silver Box with 3 Leads,
- 1 nickel silver Box with 7 assorted Needle Points. . . each, \$

1086.

Same as 1085½, without Plain Divider, but with addition of:—

- 1 Hairspring Divider, 6 in.,
- 1 Drawing Pen, 4½ in. each, \$



PROPORTIONAL DIVIDERS.



No. 1092.



1093.

1092. Brass Proportional Dividers, $6\frac{1}{4}$ in., divided for Lines; in
Case each \$

1093. Nickel silver Proportional Dividers, $6\frac{1}{4}$ in., divided for
Lines; in Case “

For other Proportional Dividers, see pages 18, 19, 20 and 49.



CASES FOR DRAWING INSTRUMENTS.

We make and furnish well-made velvet lined cases for drawing instruments. Below are listed some of the usual sizes.

When ordering a case separate from the instruments, it is necessary to send on the instruments to insure their proper fitting in the tray.

The price of the case includes the fitting of the instruments.

WOODEN CASES WITH LOCK AND TRAY.

These Cases are made of thoroughly seasoned wood, have a tray to hold the instruments, and under the tray, room for colors, brushes, etc.

Partitions under the tray for tools, colors, etc., can be added at slight additional cost.

The dimensions refer to the size of the tray in the box.

Size of Tray.		Mahogany, Brass Hinges, Shield and Lock, Tray lined with Silk Velvet.	
		No. 993.	
A.	4 × 9 in.	each	\$
B.	5 × 9 "	"	
C.	5 × 12½ "	"	
E.	7 × 11 "	"	
G.	10 × 14 "	"	

Cases of mahogany, oak or other wood, with drawers, nickel silver or plated corners, bands, name plate, escutcheon etc., made to order.

POCKET CASES

WITH FOLDING FLAPS.

These Cases are covered with morocco, velvet lined, with four flaps and button lock as illustrated on pages 62, etc.

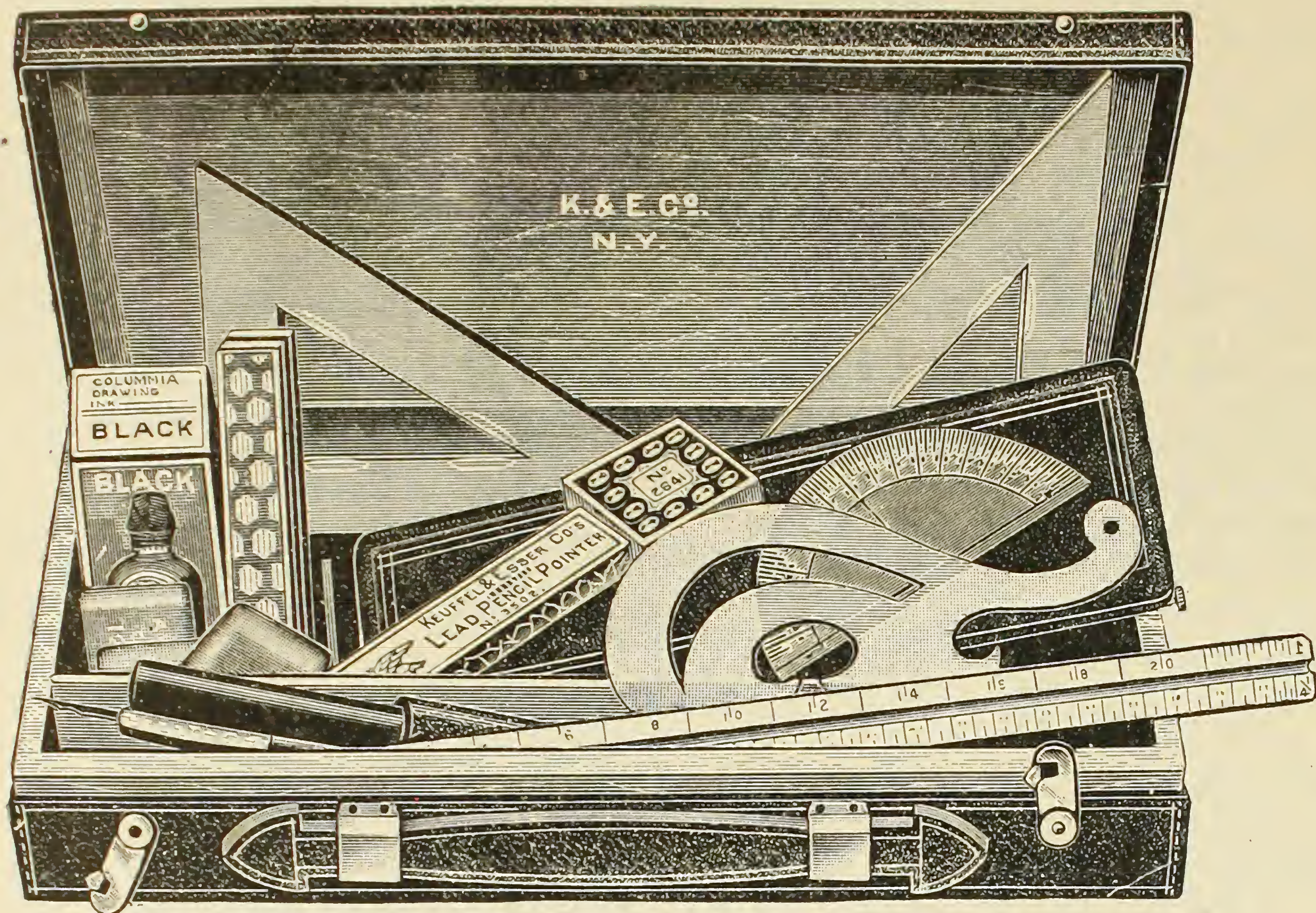
Size of Case about	Lined with Velvet.		Lined with Silk Velvet.	
	No. 996.		No. 998.	
A.	3 × 6 in.	each \$	each \$
B.	3¼ × 7½ "	"	"
C.	3½ × 8½ "	"	"
D.	3½ × 9½ "	"	"
E.	4 × 9½ "	"	"
F.	4¼ × 9¾ "	"	"
G.	4¾ × 10 "	"	"
H.	5½ × 10 "	"	"

For other cases, see page 97.



CARRYING CASE FOR DRAWING TOOLS.

(Dress Suit Case Style.)



No. 990.

N 990. Sewed Leather Carrying Case for Drawing Tools each \$

Fine Sewed Sole Leather Case, natural color, $13\frac{1}{2} \times 6\frac{1}{4} \times 2\frac{1}{2}$ in., with grip handle and nickelplated safety hooks, lined with wood and partitioned for set of instruments, triangles, curves, scales, pencils, thumbtacks, rubbers, liquid ink, pencil pointer, etc. A neat, convenient, and durable case for students and others who carry their drawing tools about.



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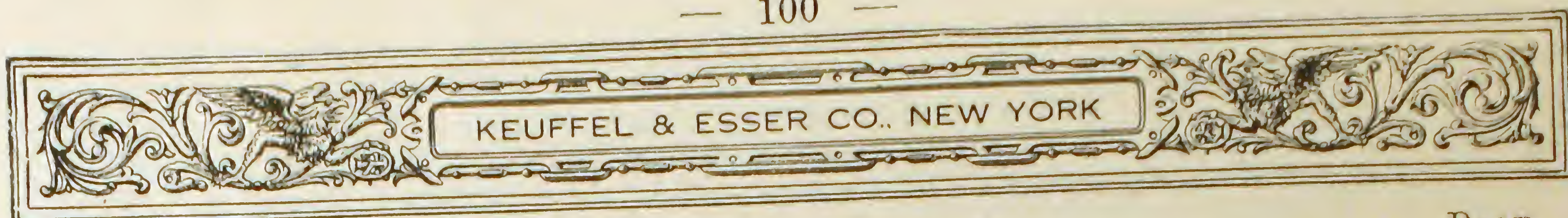
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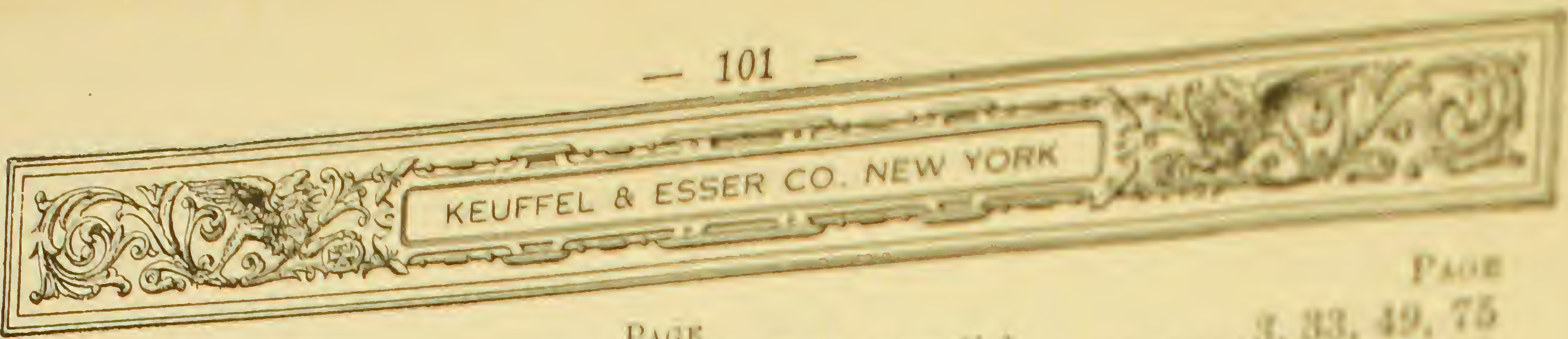
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